

## **CHAPTER 1 – INTRODUCTION**

### **1.1 Background**

North Korea (also known as the Democratic People's Republic of Korea, DPRK) is one of the world's last remaining communist countries. The Juche ideology created by Kim Il-Sung, preserved by his son, Kim Jong-Il, makes it one of the most isolated countries. DPRK's insistence on self-sufficiency since the 1950s has seen their neighbours, South Korea (also known as Republic of Korea, ROK), over take them in terms of gross national income (GNI) and per capita income, as well as become one of the world's leading technologically advanced countries. Production efficiency in the factories declined due to a lack of work incentives, agricultural fields remained barren due to shortage of fertilizers, and the transport distribution system collapsed due to decrepit infrastructure.

Their closest ally, China, is beginning to be exasperated by DPRK's constant threats of developing nuclear weapons in exchange for humanitarian aid and economic incentives. The health of Kim Jong-Il remains a great concern for those countries that follow with great interest with the developments in the Korean Peninsula. Countries, including China, and the United States of America (USA), ROK, Japan, and Russia all have important stakes should DPRK collapse suddenly.

The top echelon of this anarchical hierarchy is only concerned about political survival and economic gains. This can be seen by the occasional announcements of foreign investments in strategic parts of DPRK using special economic zones (SEZs) such as Kaesong and Rajin-Sonbong. The former being part of the unsuccessful 'Sunshine Policy' signed with the late ROK

President, Kim Dae-Jung. Under its previous administration, small and medium enterprises (SMEs) were encouraged to invest in DPRK under the processing-on-commission concept in the Kaesong Industrial Complex (KIC). Even though companies ran into barriers such as political instability resulting in the closure of the complex and sudden rise in the wages of the local workers, many other SMEs have continued to express interest to invest in DPRK due to perceived cheaper land and labour cost (Jung 2011).

The author had the opportunity to visit DPRK on two occasions from 2006-2007. The impressions obtained from the trip found the country to be interesting and unique. However, strict restrictions were placed on foreigners as passports and mobile phones were confiscated upon arrival into the airport. In addition, data collection was also impossible as local citizens and officials were only allowed to speak to foreigners in a controlled environment. This is consistent with the literature where official estimates and data on DPRK are not readily available. Even when they are, the reliability of the data is always in question.

This thesis contributes to existing knowledge by examining the implications of ROK companies' location decisions on transport and logistics policy developments in DPRK. The research objectives are as follows:

- To analyse the political and economic factors affecting DPRK;
- To appraise the present conditions of transport and logistics infrastructure in DPRK;
- To propose scenarios surrounding development in DPRK;
- To evaluate the factors affecting potential investors' location choices to develop transport and logistics strategies.

In order to achieve the research objectives, a combination of qualitative and quantitative research methods is used. In the qualitative research phase, an exploratory study with eight experts was employed to gain deeper understanding of the issues surrounding DPRK. The insights gained, together with the comprehensive literature review led to the next stage of research, (i) in-depth qualitative interviews with 38 experts and (ii) quantitative survey with 80 SMEs and 50 logistics companies. Cross-tabulations and a principal component analysis were used to evaluate their perspectives. The findings add to existing knowledge and provide theoretical and practical implications for governments and companies interested in DPRK.

This introductory chapter begins with an overview of what has been written on DPRK and identifies some gaps in the relevant literature which was dated up to 2008 when the data collection was concluded. It moves on to explain the nature of the thesis before concluding with an overview of the structure of the study.

## **1.2 The Literature on DPRK and Location Choices**

This section investigates what research has been conducted into DPRK and factors influencing SMEs location choices.

### **1.2.1 DPRK**

Researchers constantly face dilemmas when investigating DPRK. The main reason is the lack of meaningful data coming out of the country. DPRK stopped publishing national statistics after the mid-1960s. The lack of information and data is one of the major problems about DPRK (Deok 2002). Scholars researching into DPRK have to rely on predictions and any information that

trickles out of the country from time to time. The most recent economic information published by DPRK was in 2002 and 2009 when the country underwent currency and wages reform. The most widely cited figures in public discussions are those produced by ROK's central bank – Bank of Korea (BOK). However, Noland (2000) is sceptical of the method used by the BOK.

It is important to point out that research into DPRK has tended to focus on the political and economic aspects. Research into DPRK's politics centred on nuclear weapons, succession of Kim Jong-Il, scenarios of DPRK while interests in its economy varies between economic conditions, humanitarian aid, SEZs and reunification costs. Due to the nature of the country, limited research has been conducted into transport and logistical developments in the country. It is imperative to mention that there has been more descriptive than empirical research. Academics have used the historical approach comparing China and Vietnam with DPRK (Harvie, 1992; Herold, 1996; Lee, 1996; and McMillan 1996). 'Poverty trap' and 'big push' theories have been used to explain economic development and regime change (Lee 2000). A managerial approach (Park, 2005) and marketing concepts (Choe, et al. 2005) have been used to analyse its economic strategies. Statistical approaches such as the 'CGE models' (Noland et al. 2000), Social Accounting Matrix (Lee and Deok, 2004), and 'IMAGE Model' (Meade 1997) have been employed to estimate the deficiency in data.

There is limited literature on the topic of transport and logistics in DPRK. Oh's (2001) work was one of the pioneering studies looking at the strategies for developing transport infrastructure in DPRK. Kim et al (2001) focused on railways which form a major part of the transport network in DPRK, linking all

major cities. DPRK is part of the Trans-Asian Highway programme supported by UNESCAP. The project coordinates the development and upgrading of existing regional highways among member countries. Ducruet (2008) focused on ports and shipping.

### **1.2.2. Factors Influencing the Location Choices of Enterprises**

Location theories, such as Dunning's OLI paradigm, have been well researched with regards to FDI by MNEs (Ruzzier et al. 2006). In recent years, more emphasis have been placed on SMEs and their entry strategies (Nakos and Brouthers 2002; Mazzarol and Choo 2003; and Aidis 2005). Much discussion has also focused on the investment decisions of enterprises in emerging economies such as China and Vietnam (Liu et al. 1999; Zhou et al. 2002; Cheng and Stough 2006 and Kawai 2009). However, limited research was found on ROK foreign direct investment (FDI) location choices. Only two research papers were found: (i) Kimura and Lee (1998) investigated the determinants of ROK FDI in manufacturing industries using empirical study and (ii) Kang and Lee (2004) used aggregate and firm level data of Korean and Japanese foreign enterprises in China to investigate the FDI trends and factors which influence location choice.

Business enterprises have to consider an array of factors when determining their location choices. They face various types of risks such as political, economic, social and cultural risks. Many studies have criticised the sole use of quantitative factors such as costs (Czarnanski 1981 and Bhatnagar and Sohal 2005) in assessing location factors. Oum and Park (2001) used a triangulation approach using literature review, personal interviews and a quantitative survey.

### **1.3 Nature of This Thesis**

This thesis focuses on DPRK and industrial location choices. It investigates factors which influence the location choices of SMEs and logistics companies which have implications for future transport and logistics policy developments in DPRK.

There are many questions that might arise when planning strategies for transport infrastructure and logistics development. How is DPRK going to finance the redevelopment of its transport network? Will ROK or international financial institutions such as the World Bank (WB) or Asian Development Bank (ADB) provide a majority of the financing? Which transport mode should be prioritised? How is DPRK going to induce an increase in freight cargo base? What type of logistics concepts should be introduced in DPRK? What are the likely short, medium and long term strategies? The qualitative phase of the research aimed to answer these questions and develop scenarios for transport and logistics strategies.

In the foreseeable future, ROK investors, besides the Chinese, will be the only companies to invest heavily in DPRK. ROK investors have an added incentive to invest in the North due to a number of factors such as relatively lower costs of labour and land. Accordingly, this research seeks to survey ROK investors about their opinions on factors that will determine their investment in DPRK, which has implications on the priorities for transport developments and introduction of logistics concepts.

## **1.4 The Structure of This Thesis**

This thesis consists of ten chapters, including this introductory chapter.

Chapter 2 examines the political economy of DPRK. The chapter begins with an introduction of the geographical landscape, consisting of hills and mountains in the central region, depicting the difficulty for development of transport and logistics. Next, it discusses the three periods in the country's historical development which reflects the current transport system. The chapter then examines the Juche ideology and the way it affects foreign relations. It moves on to analyse the economic evolution of DPRK where it was more dominant than the South in the 1970s and early 1980s until it was overtaken. The chapter concludes by considering DPRK's attempts at reforming its economy with special economic zones and currency reforms which had little success.

Chapter 3 appraises the current transport and logistics developments in DPRK. The chapter begins by discussing the theories surrounding transport and economic development in developing countries. It goes on to examine the problems and conditions of the transport system in the Former Soviet Union (FSU) prior to its collapse to provide an understanding of the similar environment in DPRK. Next, it provides a detailed background underpinning the present conditions of the transport infrastructure in DPRK and strategies for investment to build up the decrepit transport system. It concludes by reviewing selected location theories and models. A summary of the factors influencing location choices is examined along with different ways of grouping the factors.

Chapter 4 evaluates the scenarios surrounding DPRK. This chapter introduces the disintegration and reunification scenarios; national and supra-national

development scenarios; peace scenarios; internal stability and economic change scenarios. Next, the use of scenarios in transport planning on a regional, national, supra-national and international level is discussed. The chapter concludes with analysis of scenarios constructed for DPRK. It shows that the majority of the studies did not use any techniques used to derive the scenarios.

Chapter 6 presents the results of the exploratory research. The nature of the exploratory study is to generate an understanding of the research topic in question. Therefore, statements from experts have been compared and contrasted to generate insights for the next stage of research. The chapter analyses the comments and statements made about the political, economic, technical, managerial, spatial and social aspects relating to DPRK and discusses the findings and develops the central and sub-research questions to be answer in this research.

Chapter 5 begins with the rationale for choosing the appropriate research philosophy. Next, the justification of choice and process of data collection and analysis methods (qualitative exploratory and in-depth interviews with experts and quantitative survey addressing ROK SMEs and logistics companies) are described in greater detail. The chapter concludes by discussing the ethical considerations applied to this research.

Chapter 7 presents the results of the qualitative research phase covering the different factors relating to DPRK. Chapter 8 presents the results of the quantitative survey in relation to the research questions posed. It also provides a description of the statistical techniques used for analysis.



Chapter 9 triangulates the research through linking, comparing and contrasting the discussion of the qualitative and quantitative research and findings generated from the literature review.

Chapter 10 summarises and concludes with the research by answering the central research question and research objectives. Next, it discusses the theoretical implications and describes how this research contributes to the existing knowledge on DPRK and provides policy implications for governments and companies. Limitations of this research are addressed and further recommendations are provided for further research.

## **CHAPTER 2 – INTRODUCTION TO DPRK’S POLITICAL ECONOMY**

This chapter explains the political economy of DPRK, which has shaped the development of its transport and logistical system. Historically, DPRK’s topography creates difficulties for an efficient transport network which is centred on railways and roads. It incorporates an overview of the *Juche* ideology, which is the driving force behind all decisions made in one of the most isolated countries, including transport and logistics infrastructure. This chapter also explains the economic aspects of DPRK’s position as a centrally planned economy since the Korean War. It underlines DPRK’s attempts to reform its economy since 2002. An economic overview is important to show that transport and logistics never played a major part of DPRK’s plans. Transport and logistics are not considered as part of the social infrastructure, but as an element of production, require to meet the demand for transport created by other economic activities. DPRK stopped publishing official figures since late 1960s. Since then, data on DPRK has been published by ROK and is perceived to be most reliable. Hence, there has been more qualitative, descriptive research than quantitative analysis.

### **2.1 General Overview**

The geography of DPRK underpins transport and logistical considerations. With a population of 23 million people, it is strategically located at the centre of Northeast Asia with an area of 120,540 square km. A 238km-long demilitarised zone (DMZ) separates DPRK and ROK close to the 38th Parallel. Construction on the reconnection of rail links between both Koreas began in 2004 and has yet to be completed. Besides the DMZ, DPRK has a 1,425km-long northern border with China following the Yalu River southwest between Sinuiju and

Dandong cities to the West Sea and the Tumen River that flows northeast to the Korean East Sea (Willoughby 2003). DPRK forms a 19km border with Russia with the Tumen River flowing through it. Figure 2.1 presents the geopolitical map of Northeast Asia, which shows DPRK's size and location with respect to other Northeast Asian countries. DPRK's warm temperate climate divides into four seasons, which are dry except during the rainy season of summer. Over half of Pyongyang's annual rainfall occurs in July and August. Typhoons pound the coasts, causing frequent floods and wind-damage to infrastructures. Approximately 80 percent of DPRK's land area is made up of hills and mountains separated by deep, narrow valleys with coastal plains wide in the east and west. As a result, DPRK's transport network is concentrated on the east and west coast consisting of single-tracked railways and unpaved roads. This prevents an effective and efficient flow of transport connectivity and accessibility. Figure 2.2 presents a map of DPRK indicating the major cities, main roads and railways. DPRK's major natural resources include coal, copper, magnesite, iron ore, gold and zinc.

A great success for DPRK has been the implementation of free, universal, compulsory education for 11 years, from ages four to 15, in state-run schools. DPRK enjoys a high national literacy rate for citizens 15 years of age and older is 99 per cent. Since the 1980s, there have been changing trends in DPRK's education. Priorities are placed on strengthening the political ideology, increased emphasis on science and technology, computer and foreign languages, and the introduction of optional courses as well as expansion of higher education for adults (Cho 2001). This is advantageous for both Koreas as they share a common language and culture. DPRK will be able to attract

much needed investment from the South while ROK companies will be able to take advantage of cheaper labour and land.

**Figure 2.1: Geopolitical Map of Northeast Asia**



Source: <http://www.erna.or.jp/En/Asia/map.htm>



Figure 2.2: Map of DPRK showing main roads and railways



Source: <http://www.lib.utexas.edu/maps/korea.html>

## 2.2 Historical Evolution of DPRK

Transport systems in DPRK reflect three distinct periods of recent historical development – the Korean War, and the reigns of Kim Il-Sung and Kim Jong-Il.

### **2.2.1 The Korean War**

Colonial and military influences shaped DPRK's supply chains in WWII until Korea gained liberation from Japanese colonial rule. However, the Yalta Conference in February 1945 did not produce any formal agreement by the Allied powers on the future status of Korea, only agreeing to establish a four-power trusteeship (Library of Congress 2005). In December 1945, a joint Soviet-American commission was established for the future settlement of Korea but was deadlocked for almost two years over the issue of establishing a national government. In November 1947, the U.N. General Assembly adopted the proposal by the USA to hold a general election in Korea under the observation of a U.N. Temporary Commission on Korea. In August 1948, a government was established in ROK under Syngman Rhee with the help of the USA. The United Nations (UN) assembly declared that the republic was the only lawful government in Korea. In September 1948, the Soviet Union installed Kim Il-Sung as the premier of DPRK declaring that it recognises the north as the only lawful government in Korea. In June 1950, DPRK invaded the South and began a four-year long Korean War. The War was suspended with an armistice but never concluded, splitting the peninsula along a DMZ. Since then, ROK has followed the capitalist road of a market system as introduced by the USA with huge amounts of subsequent economic aid intended to help it recover from the depths of economic misery. DPRK, in contrast, has adopted and practices the Marxist-Leninist command economy as imposed by the FSU (Hwang 1993, 26). In the areas of logistics, the concept of international supply chains have developed in the South, integrating the country with global systems. This can be seen with the development of ports and shipping in ROK. On the contrary, logistics concepts are eschewed in DPRK as a result of a command-economy

which placed little emphasis on development of transport and logistics infrastructure.

### **2.2.2 Reign of Kim Il-Sung**

After the Korean War, Kim Il-Sung established a socialist command economy, with emphasis on heavy industry, centralised government control and unquestioned, highly personalised leadership. Transport and logistics infrastructure was not considered important. Kim Il-Sung took this period (1947-1958) to consolidate his power within DPRK by purging his fellow cadres and political opponents. By the end of 1955, he had gained full control of DPRK by purging out his fellow cadres who fought with him during the Japanese Occupation and anyone else who posed a threat to him. Kim set out his vision for DPRK by introducing the 'Juche' ideology (*to be discussed later*) of self-sufficiency and self-reliance, which provides guidance in politics, economy, national defence and foreign policy. Now, Kim Il-Sung had achieved unchallenged supremacy in the Korean Workers Party (KWP). With tight control over all aspects of the DPRK policy and society, Kim Il-Sung became the "Great Leader" (Library of Congress 2005). He reigned in DPRK till July 1994 when he died of a sudden heart attack.

### **2.2.3 Reign of Kim Jong-Il**

Since the early 1970s, Kim Jong-Il was groomed as DPRK's next leader, the rightful heir of Kim Il-Sung's power and authority (Willoughby 2003). From 1980s, he was appointed to numerous important positions in the Party and in that year, it was announced that he would indeed succeed his father. After the death of Kim Il-Sung in 1994, the country went into mourning for the next three

years while the posts of General Secretary of the KWP and the President of DPRK remained empty. In October 1997, Kim Jong-Il took over the post of General Secretary and assumed command as chief of the Korean's People Army. He continued the legacy of his father by ruling the country in dictatorial fashion amidst severe economic decline and famine. In June 2000, he met the President of ROK, Kim Dae-Jung for summit talks, which resulted in greater inter-Korean exchanges, in hope of reconciliation and peace on the Korean Peninsula. However in October 2002, tensions escalated in the region when DPRK admitted it had been developing a clandestine nuclear weapons programme (Library of Congress 2005).

#### **2.2.4 Succession Plans**

Since Kim Jong-Il suffered a stroke in 2008, there has been wide speculation regarding his choice of successor. Traditionally, it has always been the eldest son who assumes the successor position. However, Kim's eldest son, Kim Jong-Nam has been ignored due to his various reasons (e.g. being caught using a fake passport). Kim Jong-Il has appointed his youngest son, Kim Jong-Un as his successor, promoting him to several important positions in KWP (IFES 2011). The effects of this succession plan will only be felt after the passing of Kim-Jong-Il. However, the objective has always been steadfast, to maintain the present regime.

#### **2.2.5 Juche Ideology**

An understanding of the basic tenets and theories of *Juche*, as well as theoretical antecedents, is necessary to understand DPRK today, its world-view and its economic system (French 2005). Western scholars have attempted to



provide meanings to the word albeit creating more confusion. According to Suk (2003), the first syllable of the Korea word, '*Ju*' means "the main or fundamental" principle; the second syllable '*Che*' means "body, self or the foundation of something. Cumings (1997) noted that *Juche* is most commonly translated as 'self-reliance' while Willoughby (2003) definition was the "Master of one's self". Scholars have found it difficult to grasp Juche's meaning since 'self-reliance' is both insufficient and disingenuous as Pyongyang has continue to rely on China and Soviet Union for aid and subsidies. A book was written by Kim Jong-Il and published in 1982 entitled '*Kim Jong Il on the Juche Idea*'. An excerpt from the book describes the Juche ideology (pg. 36):

"To establish Juche in ideology means having the consciousness that one is the master of the revolution and construction, thinking and doing everything, centring on the revolution in one's own country, and acquiring the viewpoint and attitude of solving all questions by one's own talents and initiative. The party and people of a country are masters of the revolution in that country, and to carry out the revolution in one's country successfully is the basic mission of the party and people's of one country."

Juche theory was originally introduced by Kim Il-Sung in 1955 as an ideological system and later refined by Kim Jong-Il in 1970s to extend it to all aspects of North Korea. According to Suk (2003, pg.13), DPRK's economy prominently applies to the ideological principle of Juche under the following three principles. First, the 1998 revision of the DPRK's constitution stipulates that all means of production are owned solely by the state and cooperative organisations. Under the second economic principle of central planning, the state formulates unified and detailed plans, including transport and logistics infrastructure, to guarantee a high rate of production growth and balanced development of self-sufficiency. The third economic principle of Juche is self-sufficiency.

As an economic system, Juche was a disaster as the forced industrialisation between 1950s-1970s could be maintained only through massive Soviet and Chinese aid. Seliger (2004) concluded that Juche is very much a Soviet-type central planning plus some Chinese-style additions, with many problems including: constant shortages and bottlenecks in production; soft plans (easy to fulfil for producers); bureaucratisation; distorted price structure; and emphasis on quantitative rather than qualitative growth, resulting in zero or negative growth rates once all factors of production are employed.

### **2.3 Foreign Relations**

Up until the 1990s, due to its autarkic economy, DPRK only conducted foreign relations with selected countries, namely the COMECON countries including Russia, China, some Nordic countries and some in the African continent. According to Koh (1994), DPRK's foreign track policy record in the post-cold war era is mixed. Most notable setbacks are the diplomatic normalisation between ROK and both China and Russia. Since 2004 relations between DPRK and the United States remained intense after Washington accused Pyongyang of arms trafficking and counterfeiting (Straits Times 2005). Japan is still pursuing the kidnapping of their citizens by DPRK spies in the 1960s and 1970s. On the contrary, relations with China are improving with more trade and economic links between both countries. DPRK's regime has been criticised in its domestic and foreign policies for being out of touch with reality. This theme is also central to Buzo's (1994, 244) view of DPRK's foreign policy. He argued that DPRK displays a crude, predatory outlook on foreign relations. With the collapse of the FSU and cutback in Chinese aid to DPRK, Pyongyang was left with only one potentially major source of aid in the 1990s – the General

Association of Korean Residents in Japan (known as Chonsen Soren in Japanese). This “money pipeline” funnels very substantial volumes of aid to DPRK every year (Eberstadt 1996). DPRK has been seeking to improve relations with the European Union (EU). DPRK and the EU have mostly maintained a traditional form of economic exchange and kept trade exchange to a minimum. Relations began to change after 1995 and 1996, when DPRK appealed to the international community for aid. The EU is likely to play an even more crucial role in the future in keeping DPRK connected to the rest of the world and in the role of introducing the country to the international community. As trade between DPRK and EU countries continues to grow, there will be a need to develop transport infrastructure, especially ports and its hinterlands, to cope with the growth.

Another issue that dominates DPRK’s foreign relations with its neighbours and the USA are nuclear weapons proliferation and missile sales. Pyongyang has twice withdrawn from the ‘Treaty on the Non-Proliferation of Nuclear Weapons’ in 1994 and 2003 and withdrew from talks. DPRK uses this tactic to obtain more food aid and economic subsidies. It has expertly used the Six-Party Talks to obtain more concessions from the various countries. Up till 2011, DPRK has promised to return to the table for more talks but to no avail. The other five countries each have their own agenda in bringing DPRK back to the table. The USA is concerned about a nuclear attack on its own soil. At the same time, they want to maintain a strong presence in the Korean Peninsula. China wants to maintain stability in the region as any form of collapse will send millions of migrants into its border regions. At the same time, they would like to exploit the untapped mineral resources in DPRK for its own use and also to boost the

economy of its Northeast provinces (i.e. Jilin and Heilongjiang). They would also want to use the ports to export their cargoes through to Japan. ROK wants to continually engage DPRK through trade and talks to smoothen the eventual cost of reunification. Japan would like to resolve the abduction issue. They will be willing to contribute to the rebuilding of DPRK. Russia does not have any interest or the political clout to have a major say in the political developments in the region. Their interest also lies in the minerals and transport projects which can be developed to boost their regional economy (Donga Daily 2007)

## **2.4 Economic Evolution of DPRK**

The structure of DPRK's economy consists of three economies: official, military and private. In the official economy, the government carries out the planning while prohibiting unregulated economic activities. DPRK manages the military economy (second economy) separately from its other economies. The second economy committee decides independently on production and distribution and has first priority in allocation of necessary materials and resources. Activities outside the plans have been termed the "unofficial economy" or the "private economy". A private economy operates according to market mechanisms and structure. According to Lee and Yoon (2004), in DPRK, informal markets have developed from the farmers' markets, where farmers within cooperative farms can sell agricultural products from their private plots to consumers. Farmers' markets expanded gradually in the 1980s and 1990s. Several factors caused the markets to grow rapidly: chronic food shortages; DPRK learned necessary market skills from Chinese peddlers; and the DPRK government allowed its citizens to engage in production of consumer goods.

After the Korean War, both Koreas experienced very diverse economic transformation. ROK, with the help of the USA, implemented market economy mechanisms while DPRK adopted the Soviet model with emphasis on heavy industry aided by subsidies from its neighbours, China and Soviet Union. Table 2.1 presents a comparison on both economies. Noticeably, DPRK's economy outgrew the South in the initial years. In 1960, DPRK's GNI and per capita income was twice of the South. Choe et al. (2003) provided three reasons why DPRK's per capita income was higher than ROK's during the initial periods. Firstly, DPRK possessed extensive resources to build a modern economy. It has 43 sizable varieties of mineral deposits and nonferrous metals that were non-existent or less available to ROK. Secondly, DPRK inherited the basic infrastructure of a modern economy because of Japan's substantial investment in development during the Japanese occupation. Thirdly, DPRK opted for inner directed economy, which was centred on building its heavy industries at home while avoiding commitments abroad. However from the 1970s DPRK became victim of its own success. The old equipment, including trucks and railways, that was used successfully during the early days of heavy industrialisation became obsolete and dilapidated. DPRK had to borrow heavily from its neighbours, Soviet Union and China, as well as other Western countries. This is reflected in Table 2.1 where ROK's GNI and per capita exceeded the North's from 1980s.

**Table 2.1: Comparison of the Korean economies**

	GNI (US\$ 100 million)		Per Capita Income (US\$)	
	South	North	South	North
1953	14	7	67	46
1960	19	35	79	177
1970	78	90	243	304
1980	627	434	1,645	1,161
1990	2635	572	6,147	1,142
2000	5096	168	10,481	757
2003	6086	184	12,720	818
2009	8732	224	19,450	389

Adapted from Hwang (1993), Bank of Korea (2005) and Hankyoreh (2010)

After the collapse of the FSU and Eastern Bloc in 1990, DPRK's economy went into a decline. According to Kang (2000, 174-175), besides production problems that arise from inadequate work incentives, fertilizers, and working tractors, there was also the problem of distribution. No trains were available for transport. The only alternative was the country's aging fleet of run-down trucks, which kept breaking down on the unpaved roads. Rice that was needed in the cities sat rotting in the countryside, while manufactured goods the country people needed never left the city. It is difficult to assess DPRK's economy since the government stopped publishing annual economic statistics in the mid-1960s. DPRK scholars have to rely on predictions and any information that trickles out of DPRK from time to time. The most recent economic information published by DPRK was in July 2002 and 2009 when the country underwent price and wages reform. This will be discussed in later sections. The most widely cited figures in public discussions are those produced by the BOK. However, Noland (2000) is sceptical of the method used by BOK. The annual BOK estimate of DPRK national income is constructed by applying ROK added-value weights to physical estimates of DPRK output obtained through classified methods. According to Noland, this method may differ significantly from the true

underlying figure due to the inadequacy of the calculation method and it is not verified by outside analysts.

This section details DPRK's economic development and plans since Japanese Occupation. Table 2.2 presents DPRK's economic plans from 1948 to 1995.

**Table 2.2 DPRK's Economic Plans**

<b>Plans</b>	<b>Goals and events</b>	<b>Results (DPRK figures)</b>
1-Year Plans (1947,1948)	Nationalise major industries Increase production of basic necessities	Industrial production: 1946-47: 54% increase 1947-48: 38% increase
2-Year Plan (1949-1950)	Consolidate economic foundation	Industrial production: 3-4 times greater than 1946 level
3-Year Plan (1954-1956)	Production of basic necessities Juche introduced Nationalise and collectivise farms	Industrial production: Annual growth rate: 41.5%
5-Year Plan (1957-1961)	Complete nationalisation Production of basic necessities Chollima movement Chongsan-ri and Tae'an systems	Industrial production: Annual growth rate: 36.5% Industries and farms nationalised
First 7-Year Plan (1961-1967) (extended to 1970)	Continued emphasis on heavy industry Military buildup More emphasis on Juche	Industrial production: Annual growth rate: 13% Bottlenecks appear Stop publishing statistics
6-Year Plan (1971-1976) (extended to 1978)	Improve technology Improve light industry Purchase foreign plants Three-Revolution Team Movement Speed battles	Industrial production: Annual growth rate: 16.3% Default on loans
Second 7-Year Plan (1978-1984) (extended to 1986)	Frugality/conservation plans August 3 Consumer Goods Movement Independent Accounting System Foreign Joint Venture Law Ten major targets for 1980s	Industrial production: Annual growth rate: 12.1%
Third 7-Year Plan (1987-1993) (extended to 1995)	Ten major targets for 1980s Open foreign economic trade zone Pass more joint venture laws Socialist trade relations end	Industrial production: Annual growth rate: 12.2% Admitted failure of plan in 1993 Shortages in many sectors GNP decline beginning in 1990

Source: Lee, D.W. (1996, 317-336)

#### **2.4.1 Initial Years: 1948-1956**

After WWII, the remaining, undamaged equipment and infrastructure, including railways and roads, left behind by the Japanese were considered to be the most advanced and suitable for heavy industry. DPRK became the main beneficiary and began to nationalise major industries. They inherited 76 per cent of the peninsula's mining production, 90 per cent of its electrical generating capacity, and 80 per cent of Korea's entire heavy industrial facilities.

The first One-Year Plan from 1947-1948 reported an industrial growth of 54 percent while the 1948-1949 Plan reported a 38 percent increase. Major economic policies during this period were three fold. The first goal was to consolidate factories and enterprises in workable order. Next was to promote the production of necessary goods. The last aim was to encourage agricultural production. Reconstruction of transport infrastructure was not deemed necessary by the government as it was considered to be adequate. By the end of 1950, industrial growth was three to four times greater than in 1946 as DPRK further consolidated its economic foundation, and productivity surged, pushing DPRK ahead of the South in industrial development. Economic growth was temporary halted during the Korean War. After the armistice was signed in July 1953, capital and technology assistance from the Soviet Union and its Eastern European allies, combined with manpower from the Chinese "volunteer" soldiers, helped the DPRK economy recover during the Three-Year Plan of 1954-56 (Oh and Hassig 2000). In 1955, Kim Il-Sung introduced Juche as an ideological system to justify DPRK's equidistance stance between China and the Soviet Union. A year later, when aid from both countries declined, Juche



was extended to the economy, setting economic self-sufficiency as the long term goal.

#### **2.4.2 Transition Stage: First Five-Year Plan (1957-1961)**

The objective of this plan was to strengthen the material base for a communist economy and to ensure a supply of basic necessities for the people (Hwang 1993). By 1958, nationalisation of all remaining industries and collectivisation of all farms was completed. However, as a result of a decline in foreign aid and subsidies and to squeeze out more productivity from the economy, the 'Chollima Undong' (Flying Horse) movement was launched. Chollima, designed to boost output by increasing worker's motivation, is a mass mobilisation campaign suitable for development of heavy industry. Chollima was suited for the initial period, with its inbuilt ability to drive production through ideological support and basic industrial techniques (French 2005). In order to ensure the success of Chollima, the Chongsan-Ri method and Taeon Work System was implemented. The Chongsan-ri – "on-the-spot" management method, was developed by Kim Il-Sung in 1960 during a visit to the Chongsan-ri Cooperative Farm. This method has three important components: Party officials were given much greater input in the production process in the farms and factories; Party cadres were placed as hands-on managers empowered to solve any problems and use ideas that workers confronted them with; and output was to be increased by whatever means worked, usually increased shares in the output or material rewards to the group. This kind of management developed in the Taeon Work System applied and refined agricultural management techniques to industry (Willoughby 2003). Higher level functionaries assist lower level functionaries and workers in a spirit of close consultation and camaraderie.

Party committees control the general management of factories and enterprises and stress political or ideological work as well as technological expertise. The system allows for material incentives to production. The Five-Year Plan was a success with an annual industrial growth of 36.6 percent. However by 1961, the economic policies of nationalisation and collectivisation, central planning and mass mobilisation were reaching their limits of effectiveness. Transport infrastructure was becoming dilapidated and inefficient thus needed new investment.

#### **2.4.3 First Seven-Year Plan (1961-1967)**

Although DPRK first patterned its economic system on the Stalinist model, Chinese influence on DPRK economic policy has been increasingly important since the mid-1960s (Kang and Lee 1992). Buoyed by the strong economic growth in the last decade, DPRK continued to emphasise heavy industry and labour mobilisation and extended Juche as the guiding thought to military self-defence. Kim Il-Sung began to increase the rate of investment in heavy industry from 40 percent to in excess of 65 percent of total state investment by mid-1960s. Pyongyang launched its 'Great Leap Outward' policy of buying up plant and machinery from the West and Japan and Western businessmen travelled to DPRK to sell, encouraged by the annual published growth rates in the 1950s and 1960s. As a consequence of achieving a certain level of economic progressiveness, the country was destined to enter a new phase of industrialisation. According to French (2005), DPRK acquired the world's largest cement factor as well as a watch factory, paper mill, steel mill, fertiliser and chemical plants. However, as labour and resources were stretched to their limit, bottlenecks appeared in the economy causing widespread slowdowns and

reverses in growth for the first time. There were shortages of arable land, skilled labour, energy, transportation and minerals. These bottlenecks were clear signs that the economy was suffering from central planning and required diversification of production and emphasis on technology as a means of increasing productivity. However, Kim Il-Sung had no economists who were able to tell him that those plans need to be changed. Disappointing performance forced the planners to extend the plan three more years until the 1970s suggesting that some economic targets had not been met. After the early 1960s, DPRK stopped publishing official economic statistics except for percentage increases over previous periods. During the last part of the de facto ten-year plan, emphasis shifted to pursuing parallel development of the economy and defence capabilities. This was due to the threats posed by the military takeover in ROK by General Park Chung Hee, involvement of American troops in Vietnam, and the widening Sino-Soviet conflict. In the end, the necessity to divert resources to defence became the official explanation for the plan's failure (Library of Congress, 2005).

#### **2.4.4 The Six-Year Plan (1971-1976)**

The Six-Year Plan of 1971-1976 followed immediately in 1971. In the aftermath of the poor performance of the previous plan, growth targets were scaled down substantially. As some of the proposed targets from the previous plan were not achieved, the Six-Year Plan did not deviate much from its predecessor in basic goals. The Six-Year Plan placed more emphasis on light industry and technological modernisation, self-sufficiency in industrial raw materials, improving product quality, correcting imbalances among different sectors, developing the power and extractive industries and reduction of the bottlenecks

of the previous plan. The plan called for attaining a self-sufficiency rate of 60 to 70 percent in all industrial sectors by substituting domestic raw materials wherever possible. Improving transport capacity was seen as one of the urgent tasks in accelerating economic development as it was one of the major bottlenecks. In recognition of the limitations inherent in its home-grown technologies, DPRK purchased some \$500 million worth of industrial plants, mostly from Japan (Oh and Hassig 2000). The oil crisis on 1973 depressed the price of the minerals that DPRK exported. As a result, Pyongyang defaulted on its debts from 1974, halting the importation of western technology. In order to speed up the early accomplishment of the plan, DPRK launched the Three Revolution Team (TRT) Movement. This movement was more ideological than economic, which required teams to visit farms and factories throughout the country spreading technological, ideological and cultural ideas. DPRK also employed new speed battles, which exhausted labour resources and did little for the long-term growth of the economy. DPRK claimed to have fulfilled the Six-Year Plan by one year ahead of schedule, with an annual growth of 16.3 percent. Under these circumstances, the next plan would start without delay in 1976. However, there was a prolonged delay and the next plan did not start until 1978. This suggests that the targets were under fulfilled and a buffer period was needed to attain the plan's goals. The inability of the planners to continuously formulate and institute economic plans reveals as much about the inefficacy of planning itself as the extent of the economic difficulties and administrative disruption facing the country (Library of Congress 2005). Aside from under fulfilment, widespread disruptions and imbalances among various sectors of the economy further complicated plan formulation.

#### **2.4.5 The Second Seven-Year Plan (1978-1984)**

DPRK launched its second Seven-Year Plan in 1978 with aims of strengthening the economy, promoting self-reliance and exports of manufactured goods and modernising the transportation sector. The emphasis on self-reliance was twofold: the influence of Juche on all economic policies and mounting foreign debts originating from large-scale imports of Western equipment and machinery in 1970s. By this time, Kim Jong-Il, the son of Kim Il-Sung, was making many of the major decisions. He initiated the 'August Third Consumer Goods Movement', which aimed at improving the lives of the people. However, this movement was doomed to fail due to the substandard quality of the goods products and shortages of raw materials. In addition, the transport equipment has become obsolete and run down. Even when raw materials were available, there were no trains and trucks often broke down. Performance of the second Seven-Year Plan was comparatively good for the first three years, from 1978 to 1980, but industrial production became extremely unstable after the Sixth Congress of the KWP in 1980. At the same time, Kim Il-Sung announced the grand plan to achieve "Ten Major Targets of Communist Economic Construction in the 1980s" for electricity generation, coal, steel, cement and mineral production, fertiliser and grain production, textile and tideland reclamation (Oh and Hassig 2000). Towards the final part of the plan, two economic adjustments were initiated. The Independent Accounting System gave more autonomy to state enterprises at local level. According to the new provisions, DPRK enterprises can retain part of their plan-quota profits as enterprise funds when they over-fulfil their profit plans. In addition, the Foreign Joint Venture Law was enacted with optimism that western companies will bring investment into DPRK. From all indications, it appears that the second Seven-Year Plan was not successful as DPRK

generally downplayed the accomplishments of the plan. Although it was declared that the targets of the plan were met on schedule, with an annual growth rate of 12.1 percent, there was no new economic plan for two years, indications of both the plan's failure and the severity of the economic and planning problems plaguing the economy.

#### **2.4.6 Third Seven-Year Plan (1987-1993)**

The final Seven-Year Plan continued to focus on Kim Il-Sung's ten major goals of the 1980s for fulfilment. By 1989, majority of the targets were still unfulfilled resulting in revision of the targets till 1993. The plan also gives a great deal of attention on the development of science and technology, and on foreign trade and joint ventures. In 1991, Rajin-Sonbing Free Economic Zone (FEZ), located on the Russian-Chinese-DPRK border, was created in conjunction with the United Nations Tumen River Economic Development Plan. However, the FEZ attracted only a total of US\$67 million during a seven year effort until 1997, then the government closed down the area. New investment laws were passed in 1992 to supplement the original 1984 laws to make it more attractive for foreign companies. The collapse of the Soviet Union in 1991 destroyed any hopes of fulfilling the ten major goals. It had a detrimental impact on DPRK causing the economy to go into a decline. DPRK was unable to change its economic and trade policies to cope with the sudden shock of the Soviet Union demise. Soviet Union had been DPRK's major trading partner and aid contributor. In 1991, it supplied over 40 percent of DPRK's imports; by 1993 it had fallen to below 10 percent. Table 2.3 below shows the overview of DPRK's economy from 1985 to 2004. From 1990, the gross national product (GNP) of DPRK started to decline from \$23.1 billion to \$20.5 billion in 1993 while the total trade decreased by

more than 40 percent from \$4.72 billion in 1990 to \$2.64 billion in 1993. The government was forced to admit the failure of the third Seven-Year Plan (1987-1993), stating that some major indices including electric power, steel and chemical fibre failed to be attained due to international events and the acute situation created in Korea (French 2005). An adjustment period of two years was set aside to concentrate on agriculture, light industry and foreign trade. With the sudden death of Kim Il-Sung in 1994, the third Seven-Year Plan (1987-1993) and the ten major targets were forgotten in the struggle to avoid economic collapse (Oh and Hassig 2000).

**Table 2.3: Overview of DPRK's Economy (1985-2008)**

<b>Year</b>	<b>GNP (US\$ billion)</b>	<b>Per Capita GNI (US\$)</b>	<b>Exports (US\$ billion)</b>	<b>Imports (US\$ billion)</b>	<b>Total Trade (US\$ billion)</b>
<b>1985</b>	15.1	757	1.31	1.78	3.09
<b>1986</b>	17.4	853	1.51	2.07	3.58
<b>1987</b>	19.4	936	1.65	2.50	4.15
<b>1988</b>	20.6	980	2.03	3.21	5.24
<b>1989</b>	21.1	987	1.91	2.89	4.80
<b>1990</b>	23.1	1,142	1.96	2.76	4.72
<b>1991</b>	22.9	1,115	1.01	1.71	2.72
<b>1992</b>	21.1	1,013	1.03	1.64	2.67
<b>1993</b>	20.5	969	1.02	1.62	2.64
<b>1994</b>	21.2	992	0.84	1.27	2.11
<b>1995</b>	22.3	1,034	0.74	1.31	2.05
<b>1996</b>	21.4	989	0.73	1.25	1.98
<b>1997</b>	17.7	811	0.91	1.27	2.18
<b>1998</b>	12.6	573	0.56	0.88	1.44
<b>1999</b>	15.8	714	0.52	0.96	1.48
<b>2000</b>	16.8	757	0.56	1.41	1.97
<b>2001</b>	15.7	706	0.65	1.62	2.27
<b>2002</b>	17.0	762	0.74	1.52	2.26
<b>2003</b>	18.4	818	0.77	1.61	2.38
<b>2004</b>	20.8	914	0.91	0.93	1.84
<b>2005</b>	24.2	1,056	1.04	1.07	2.11
<b>2006</b>	25.6	1,108	1.21	1.23	2.44
<b>2007</b>	26.7	1,152	1.38	1.41	2.79
<b>2008</b>	27.3	1,065	1.58	1.63	3.21

Source: Bank of Korea (2011)

#### **2.4.7 Economic Crisis (1994-2002)**

By now, DPRK was facing the full effects of the collapse of the Soviet Union, causing the economy to spiral into a crisis. At the same time, the whole nation was still suffering from the shock death of their 'Great Leader'. DPRK became increasingly isolated internationally and was being described as a 'pariah state' (French 2005, 112). The collapse of the official economy led to a dramatic decrease in government investments. The country came to a standstill because the citizens were concerned with feeding themselves. As the weight of the government declined after 1994, the private economy continued to expand. Even though the private economy has the capacity for investment, there were no channels in place to facilitate it. The country was reaching a dire strait. However the government under Kim Jong-Il continued to persist with ineffective policies. Table 2.4 presents the economic development strategy under Kim Jong-Il's leadership from 1994 onwards. He designated the period between 1994-1996 to promote revolutionary strategies focusing on agriculture, light industry and trade. The DPRK leader stressed the need for a change in the attitudes of the economic experts to develop foreign trade. However in 1994, DPRK admitted that food shortages had deteriorated into famine and appealed to the international community for food aid. Famine in DPRK occurred as a result of failed economic and agricultural policies. According to French (2005, 126), political answers to agricultural inadequacies are not uncommon in planned economies. In the FSU, a regular event was the mass mobilisation of soldiers, and often students, to help first plant and then gather the harvest, though much remained left in fields or warehouses to rot due to the poor internal transportation structure. To worsen the situation, there was serious flooding in 1995 and 1996 which left millions dead.



**Table 2.4 Economic Development Strategy under Kim Jong-Il's Leadership**

<b>Year</b>	<b>Strategies</b>
1994-1996	The period of “revolutionary economic strategy,” characterised by the three “firsts” – agriculture, light industry and trade
1997-1998	The period of transformation, characterised by reinstatement of the self-reliant national economy policy
1999-2001	The motto of “building an economic powerhouse” and/or development of technology and improvement of economic management.
2002-Present	Reform and open-door policy or “defence industry first” policy?

Source: Park (2004)

Realising the failure of its revolutionary economic strategies, DPRK renewed its commitments to the self-reliant national economic policy in 1997. The regime returned to its traditional economic development strategy composing of inward-oriented industrialisation, “heavy industry first” policy and intensive development methods. The economy was at its lowest point in 1998 with its gross national product and trade amounting to US\$12.6 billion and US\$1.44 billion respectively. Imports, consisting of mainly food aid and fertiliser, amounted to only US\$0.88 billion. This was partly due to the ‘1997 Asian Financial Crisis’. In 1998, DPRK amended its constitution to allow a more flexible economic system reflecting the growth of private economic activities. Reudiger (2003), made some conclusions from the new amendments. The overall goal of the leadership in DPRK is to stay in power, to stabilise its position and to actively pursue its goals. Transparency, a basic demand of international organisations, was also emphasised in connection with the reforms.

DPRK’s aims from 1999 onwards were to be an economic powerhouse and/or improve technology and management. Kim Jong-Il knew that his regime faced certain collapse without foreign investment in DPRK’s crumbling economy. So he embarked on a strategy of building up positive foreign relations with its

neighbours and the USA in order to attract much needed foreign investment. DPRK's relationship with the USA was at its highest point when the Clinton Administration was still in office in 1999. Up until 1998, DPRK had experience a negative growth rate since the collapse of the FSU. Choe et al. (2003) provided several reasons why DPRK suffered from negative economic growth for almost 10 years. Firstly the collapse of the FSU deprived DPRK of their major trading partner and provider of economic assistance. Secondly, consecutive floods in 1995 and 1996 and record drought in 1997 caused massive loss of crops and cultivated land. Thirdly, DPRK built its economy mainly with heavy industries to support its military while neglecting consumer goods. Lastly, poor implementation of the rationing system and an uneven distribution of wealth among the people caused the DPRK economy to sink. In 1999 and 2000, DPRK enjoyed growth of 6.2% and 1.9% respectively. This is mainly due to the increased inter-Korean relations, which will be discussed later.

According to Park's (2004), DPRK's economic development strategy under Kim Jong-Il's leadership can be said to have undergone relatively positive changes. Table 2.5 provides an assessment of those strategies. He concluded that the future of DPRK economy depends on achieving internal consistency in its economic policies and improving relations, including a resolution of the nuclear conflict with the United States.

**Table 2.5: Economic Development Strategy of Kim Jong-II Era**

	<b>Reform</b>	<b>Opening</b>	<b>Resource allocation</b>	<b>Technology revolution</b>
1994-1996: Revolutionary Economic Strategy	Weak	Stressed	Normal	Weak
1997-1998: Transition Period	Emphasis	Weak	Normal	Emphasis
1999-2001: Strong and Prosperous State	Emphasis	Weak	Distorted	Emphasis
Since July 2002	Practicing	Practicing	Distorted	Emphasis

Source: Park (2004)

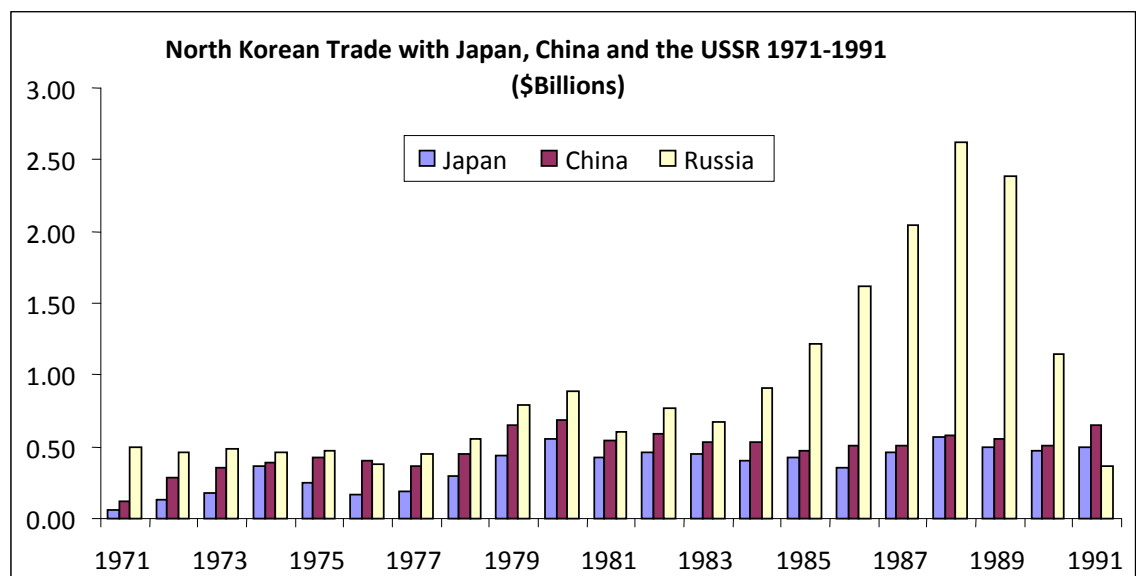
#### **2.4.8 Foreign Trade and Investment (1971- present)**

Foreign economic relations have been influenced by Juche ideology and the development strategy of building an autarkic economy. These factors led to an inward-looking and import-substituting trade policy, which has resulted in the small scale of foreign trade and a chronic trade deficit. Theoretically, DPRK adheres to its principle of self-reliance. However, Pyongyang is flexible whenever the economic need arises. After the Korean War, DPRK received a massive amount of economic aid from Soviet Union and China to reconstruct its war torn economy. In the 1960s and 1970s, there was an influx of Western and Japanese machinery. In the 1980s, DPRK opened its economy through joint venture laws.

Historically, DPRK's main trading partners have been communist countries, mainly China and Soviet Union, as well as Japan who has been a major trading partner since the 1960s. Figure 2.3 below shows DPRK's foreign trade with Japan, China and the Soviet Union from 1971-1991. Up until 1991, after its collapse, Soviet Union has been DPRK's main trading partner. Soviet Union was the only place where DPRK's goods could be sold due to two reasons. Firstly, the difficulty of marketing its products elsewhere and secondly, western

countries were reluctant to extend financial credit to DPRK after its default on foreign loans in 1970s. DPRK's principal exports were non-ferrous metals, textile, military equipment, and marine products. Its main imports were advanced machinery, transport equipment, crude petroleum, wheat and chemicals. DPRK has two main ports which it uses – Chongjin, located in northeast of DPRK, and Nampo, situated in the southwest.

**Figure 2.3 DPRK's Foreign Trade with Japan, China and the USSR 1971-1991**

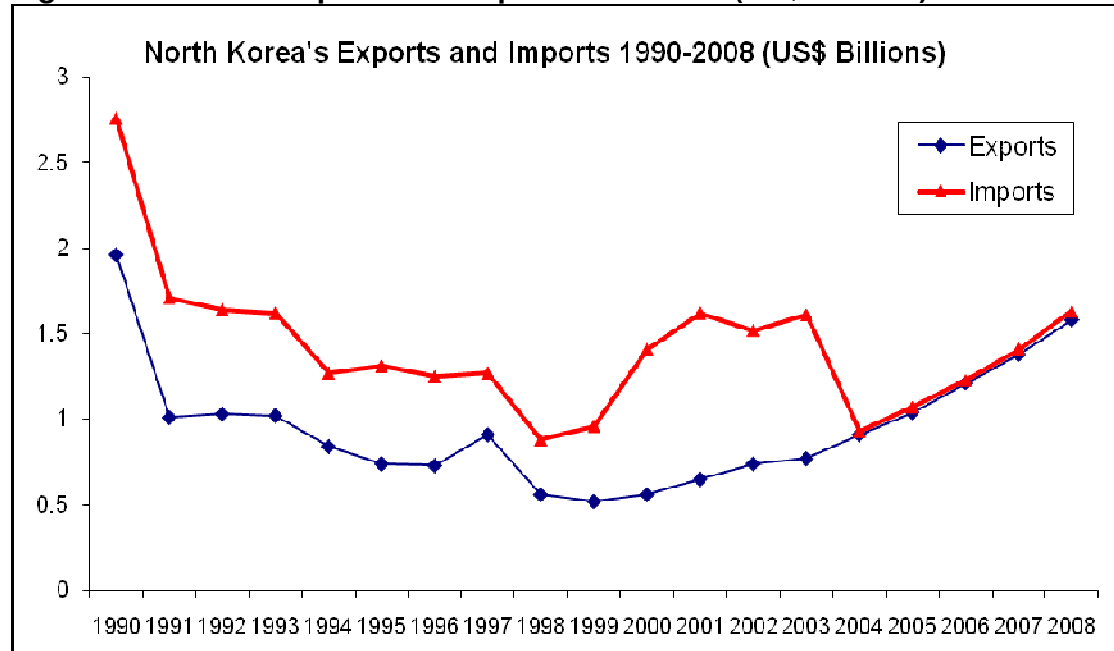


Source: Adapted from Lee (1994)

The volume of contribution from foreign countries has declined substantially, especially in terms of total trade volume. Both imports and exports dropped because of the breakdown in the international cooperation network as well as internal industrial organisation. From Figure 2.4 we can see that exports decreased significantly from US\$1.96 billion in 1990 to US\$0.65 billion in 2001. Imports dropped from US\$2.76 billion in 1990 to a low of US\$0.88 billion in 1998 before recovering slightly to US\$1.62 billion in 2001. As mentioned earlier, there were no markets for DPRK goods thus accounting for the decreased in exports. A majority of the imports can be attributed to a small amount of aid

from China and Japan. Since 2002, DPRK's foreign trade has been steadily increasing though still insignificant compared to the pre-Soviet collapse era.

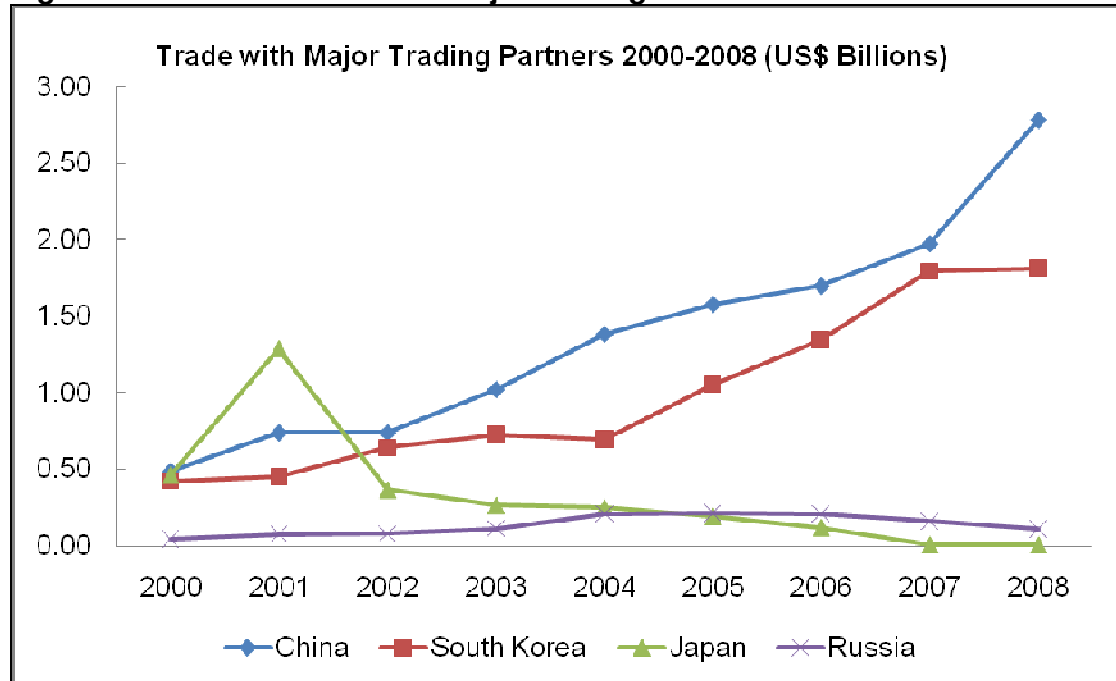
**Figure 2.4 DPRK's Exports and Imports 1990-2008 (US\$ Billions)**



Source: BOK (2011)

In recent years, DPRK's main foreign trade is conducted with four countries. Figure 2.5 presents DPRK's estimated trade with its major trading partners in from 2000 to 2008. China remains the largest trading partner with, followed by ROK, Russia and Japan. The official trade figures between DPRK and China in 2004 and 2008 was US\$1.39 and US\$2.79 billion respectively. The unofficial figures could be higher considering the amount of illegal cross-border trade up in the northern part of DPRK (Marquand 2005). Trade (the Ministry of Reunification in ROK prefers the term "inter-Korean exchanges") between both Koreas average around US\$0.71 billion. It was expected to reach a high of US\$1 billion in 2005 due to the opening of the Kaesong Industrial Complex (IHT 2005). As of 2008, trade between both Koreas is \$1.82 billion.

**Figure 2.5: DPRK's Trade with Major Trading Partners 2000-2008**



Source: BOK (2011)

Recent developments show that foreign companies are gradually showing confidence in investing in DPRK. British American Tobacco admitted to having a US\$7million joint venture in Pyongyang since 2001, making two billion cigarettes a year for the local market (Foster-Carter 2005). In May 2005, a Singapore law firm received a licence to practice in DPRK (Greenlees 2005). The firm is the first wholly owned foreign legal practice in DPRK after the country re-enacted its foreign investment laws and permit full foreign ownership of some ventures. Beijing's presence is growing too. In October 2005, a new US\$24 million Chinese-aided glass plant near Pyongyang was opened. China has also invested more than US\$12 million in Musan iron ore, located in northern part of the country near the Chinese border, importing a million tonnes of ore a year. In order to facilitate trade and regional growth, DPRK needs an efficient transport infrastructure which is severely lacking at the moment.

## 2.5 DPRK's Economic Reforms (2002 – present)

By 2002, the economic situation in DPRK had become calamitous. There were chronic food shortages and aid donations were declining due to political standoff between DPRK and USA as well as donor fatigue. The industries were left on a standstill. Pyongyang has always resisted reforms, which might lead to undue influence on its citizens. However, with collapse imminent, Pyongyang announced a series of new economic measures aimed at revitalising its declining economy and imposing a greater control on the country. Table 2.6 summarises the reform measures and direction of economic changes.

**Table 2.6 July 2002 Reform Measures in DPRK and Direction of Economic Changes**

<b>Direction of Economic Changes</b>	<b>Contents of Reform</b>	<b>Policy Measures for Reform</b>
Changes in economic management	Planned economy to monetary economy	Increase in prices and wages, abolition of rationing systems
Reintegration with the international market	Isolation from international market to connect with international market	Readjustment of exchange rate, abolition of exchange coupons
Change in business management	Ethical, social motivation to material, individual motivation	Strengthening the self-supporting accounting system of corporations, material incentives, increase in autonomous distribution of agricultural products

Source: Lee and Deok (2004)

### 2.5.1 July 2002 Reform Measures

A cornerstone of the new economic policy is the change in DPRK's economic management system aimed at creating incentives and accountability. Table 2.7 presents the major changes. DPRK installed younger managers, aged 30 to 40, in major enterprises. These more reformed minded managers had received prior overseas economic training in the market economy. Another change was

the revaluation and enlargement of the role of farmers markets. Private markets gained additional importance as the official economy became unable to provide sufficient food to the people. The government expanded the farmers market into comprehensive consumers market, managed under a government enterprise system, and enhanced the diversification of consumer goods. Price ceilings, revised every 10 days according to supply and demand, are set on essential goods such as rice and oil. The government also permitted more autonomy for factories and state enterprises. The state still sets a standard price for goods but factories can specific prices that differ from this standard price if they first gain approval from a supervisory organisation. Government enterprises and cooperative bodies are permitted to procure as well as sell their output. Reform measures also introduced economic concepts such as monetary economies emphasising price control mechanisms and, science and technology.

**Table 2.7 Major Changes in DPRK's Economic Management System in 2002**

<b>Changes</b>	<b>Details of Changes</b>
Replacement of managers	Managers aged 30 to 40 have been named in major enterprises.
Revaluation and enlargement of the market's role	Farmers market has been expanded into a comprehensive consumers market. Enhanced diversification of consumer goods. Price ceiling set on essential index goods such as rice and oil. Prices are set every 10 days according to supply and demand. Markets run under a government enterprise system. Market fees and government payment imposed on market vendors.
Enhanced autonomy of factories and enterprises	Government enterprises/cooperative bodies permitted to participate in market activity. Factories/enterprises permitted to supply basic goods within a bound of 30 percent. For Pyongyang Tongil Market, about 5 percent of returns allocated to factories and enterprises.
Introduction of the notion of competition	Competition in soap and toothpaste encouraged via price equalisation.
Introduction of other economic	Massive commercial ad placed in downtown Pyongyang. Economic courses reorganised emphasis on financial and



notions	monetary economies; emphasis on price control mechanism. Science and technology reorganised as intellectual market goods. Contracts between research labs and enterprises are made obligatory.
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Source: Lee and Deok (2004)

### 2.5.2. Special Economic Zones

SEZs are administrative zones with special economic legal status and are physically and legally separated from the rest of the country. Strong economic autonomy is provided under the guidance of market economy principles, and special economic consideration given to foreign companies investing in the SEZs (Jung et al. 2003). DPRK's experiments with special economic zones have been going on for more than a decade. The first economic zone located in Rajin-Sonbong was created in 1991, close to the Russian and Chinese borders in the northeast. Due to a lack of investment from the government and its remote location, Rajin-Sonbong was officially deprioritised in 1997. In 2001, Kim Jong-Il visited China and saw first-hand the benefits of the SEZs on China's economy. In September 2002, as part of its efforts to reform and opening, DPRK announced the creation of a 132 square mile special administrative zone similar to Shenzhen and Suzhou developments in China. In addition, Kaesong Industrial Complex was announced. Kaesong is the first major industrial collaboration between the North and South. DPRK anticipates the SEZs to aid in earning hard currencies, which will facilitate trade with other countries. In addition, foreign companies will transfer technology and management skills to the SEZs thereby boosting productivity of local labour. This section will review the developments of both Rajin-Sonbong and Shinuiju SEZs. Table 2.8 presents the differences between SEZs. Kaesong Industrial Complex will be discussed in detailed in the next chapter.

**Table 2.8: Comparison between Rajin-Sonbong and Sinuiju Zone**

	<b>Rajin-Sonbong zone</b>	<b>Sinuiju Area</b>
Location	<ul style="list-style-type: none"> <li>• Belongs to Hamkyongbuk-do</li> <li>• Riparian to the Tumen River</li> <li>• Close to border with China and Russia</li> <li>• Remote from major consumer markets</li> </ul>	<ul style="list-style-type: none"> <li>• Belongs to Yanggakdo</li> <li>• At mouth of Yalu</li> <li>• Bordering Dandong</li> <li>• Convenient for export to China and Korea</li> </ul>
Population	<ul style="list-style-type: none"> <li>• Rajin-Sonbong (200,000)</li> <li>• Hunchun (300,000)</li> </ul>	<ul style="list-style-type: none"> <li>• Shinuiju (321,000)</li> <li>• Dandong (700,000)</li> </ul>
Nature of zone/area	<ul style="list-style-type: none"> <li>• Mainly for multilateral economic cooperation</li> <li>• Laboratory of market economies</li> </ul>	<ul style="list-style-type: none"> <li>• Mainly for trade between North Korea and China</li> <li>• Good harbour with natural trading</li> </ul>
Major target markets	<ul style="list-style-type: none"> <li>• Markets of Russia, Japan and China</li> </ul>	<ul style="list-style-type: none"> <li>• Korean domestic market</li> <li>• Chinese domestic market</li> </ul>
Industries for FDI	<ul style="list-style-type: none"> <li>• Light industries for export processing</li> <li>• Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Light industries for export processing</li> </ul>
Central government's support	<ul style="list-style-type: none"> <li>• Strong policy and institutional support</li> </ul>	<ul style="list-style-type: none"> <li>• Weak because of security concern</li> </ul>
Political sensitivity	<ul style="list-style-type: none"> <li>• Insensitive as it is remote from Pyongyang</li> <li>• Little political intervention</li> </ul>	<ul style="list-style-type: none"> <li>• Very sensitive</li> <li>• Frequent intervention by the party and government</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>• Less developed than Nampo-Haeju area</li> <li>• Ambitious plan for infrastructure expansion and improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively good infrastructure for ocean, railway and road transportation</li> </ul>
Sourcing of raw materials	<ul style="list-style-type: none"> <li>• Disadvantageous for the outsourcing of raw materials</li> </ul>	<ul style="list-style-type: none"> <li>• Advantageous for the outsourcing of raw materials</li> </ul>
Tax benefits	<ul style="list-style-type: none"> <li>• 14 percent corporate income tax</li> <li>• No corporate tax for three years, 50 percent for the next two years.</li> </ul>	<ul style="list-style-type: none"> <li>• 25 percent corporate income tax</li> <li>• No tax holidays</li> </ul>
Labour supply	<ul style="list-style-type: none"> <li>• Priority in supply of labour</li> </ul>	<ul style="list-style-type: none"> <li>• Uncertain policy</li> </ul>
Currency for settlement	<ul style="list-style-type: none"> <li>• Foreign exchange certificates abolished in June 1997</li> </ul>	<ul style="list-style-type: none"> <li>• North Korean won</li> </ul>
Cross-border trade	<ul style="list-style-type: none"> <li>• Border trade with Primorsky and Jilin province</li> </ul>	<ul style="list-style-type: none"> <li>• Border trade with Liaoning province</li> </ul>

Source: Kim (2001)

The Rajin-Sonbong zone is located in the United Nations designated Tumen River Economic Development Area (TREDA), together with Hunchun in

northeast China and Posyet in the Russian Far East. Part of the reason for establishing Rajin-Sonbong was the creation of Hunchun Development Plan made public by China in July 2000 (Young 1999). DPRK realised that China would take initiative in the TREDAs if the Hunchun Development Plan made rapid progress and would ultimately undermine the potential of Rajin and Chongjin as export bases. In 1991, DPRK declared Rajin City and Sonbong County a FEZ, in which foreign owned enterprises would be permitted to operate. Rajin, Sonbong and Chongjin were declared free ports and various taxation benefits were offered to the investors in this zone. According to Cotton (1996), the government had envisaged three types of development. Firstly, Rajin was to become a major container and transshipment port for the Northeast Region, with linkages to Mongolia and China. Sonbong will specialise in crude oil and petrochemical products while Chongjin will handle bulky cargo including cement, iron ore, coke and grains. Secondly, the zone is to become a major tourist destination. Thirdly, the zone is to host export oriented industry which will ultimately employ a majority of the working population. The location of the zone presents several advantages. The zone may work as a transit centre between Asia and Europe making use of the Trans-Siberian Railway (TSR). It may serve as a competitive export processing base as its wages are lower than China. Given its rich natural resources in the region, the zone may provide potential foreign investors with good opportunities to develop and process natural resources, including forest, energy and rare mineral ore, targeting the nearby export markets of Northeast Asian countries (Kim 2001). The zone encountered numerous problems. It faced stiff competition from China's SEZs where infrastructure was better established and political conditions were more predictable. Most importantly, the zone was unattractive to foreign investors

due to its remote location. By 1997, there were only 111 cases of investment contracted and their total amount was about US\$751 million. However the actual amount realised was only US\$62 million in 77 cases (Young 1999). At the end of 1997, the government decided to close the zone. In analysis the failure of Rajin-Sonbong, there were political and non-political factors. Political obstacles include leadership subjectivism, overindulgence in Juche ideology, insistence of economic self-reliance, and fear of economic domination by Japan and ROK (Kim 2001). Non-political impediments include inefficient transportation and telecommunications infrastructure and wrong location decisions. Location advantage is realised in the long term only if and when appropriate transport infrastructure is in place in the zone. Many foreign investors view a modern and efficient transport and logistical infrastructure as a prerequisite for their investments. This was lacking in roads and railways in DPRK. Roads were so inefficient that it took almost twice the time normally required to deliver goods for the same distance in ROK. Four ports in the Russian Far East, equipped with modernised transport and logistics infrastructure, took away a substantial proportion of cargo otherwise would have been channelled through DPRK ports. The zone may soon experience a new lease of life. In October 2005, a Chinese entrepreneur secured a deal with the DPRK government to open and develop the dilapidated port of Rajin (Anderlini and Yan 2005). In 2007, Russian authorities agreed to invest in the port (Donga Daily 2007).

After the failure, DPRK stopped experimenting with special economic zones until they saw firsthand its benefits to China's economy, more importantly, the earning of much needed hard currency. In September 2002, the development of

Sinuiju Administrative Zone (SAZ) was announced. Sinuiju is located across the Yalu River from the city of Dandong, China. For a 50-year term, the SAZ will operate its own legislative, judiciary and administrative functions and have its own legal and economic system, free of central government interference (Kim and Lee 2002). It seems that the SAZ enjoyed a high level of autonomy and a legal infrastructure to attract foreign investors. The plan also called for 500,000 current Sinuiju residents to be replaced by 200,000 technically skilled residents from DPRK and China. Sinuiju was created to facilitate trade between China and DPRK targeting domestic markets in both countries. Cross border trade is prevalent with Chinese traders selling electronic equipment, stainless steel goods and gleaming appliances while DPRK merchants trade agricultural, textile and clothing. According to Marquand (2005), Sinuiju possesses relatively good infrastructure for ocean, railway and road transportation. According to Kim and Lee (2002), due to Sinuiju's strategic location, it is likely to benefit from the TSR and Trans-China Railways (TCR) transportation connections which are being actively reconstructed, that will allow people and goods to move from the Korean peninsula to Europe on land. To show the international community that it was serious in attracting foreign investment, the government appointed a foreign national (Yang Bin – Chinese/Dutch entrepreneur) as its first Administrative Minister. However, this appointment did not please the Chinese government. Yang Bin was later prosecuted for tax evasion charges. Presently, Sinuiju is left in a shambles with little progress.

### **2.5.3 Transition and Reform Strategies**

As the focus of this research centres on the development of transport and logistics, a detail discussion on transition economies will not be relevant here.

However, it is important to briefly mention some examples of countries that have successfully transitioned from a centrally planned to an open economy assessing their applicability to DPRK. It is important to mention that copying any of the models would deny the idiosyncratic nature of development in DPRK (McMillan 1996). Some recent examples of reforms will be highlighted.

Discussions on the appropriate transition models that DPRK should adopt have tend to focus on China, Cuba, and Vietnam. China's "step-by-step" reform approach is most commonly advocated (Herold 1992 and Harvie 1992). This approach's refers to the whole gradual process of market reforms which contrasts with the radical transition of the Soviet Union and East European Countries. Key features of China's reforms include abolishing agricultural collectives; massive entry by new non-state industrial farms; new incentives for state-owned enterprises; creating competition and fostering entrepreneurship. However, despite its reasonable success, it is believed that China is not a model for DPRK to emulate (McMillan 1996 and Reudiger 2003). Kim (2001) proposed the Cuban model, which has more similarities with DPRK's current situation. Ruediger (2003) suggested that ROK in the 1960s is a much better example than China. Cultural, demographic and geographical factors provided strong arguments. Jo (2004) also points out fundamental differences between the case of DPRK and cases of China and Vietnam. DPRK fears of being absorbed by the SK economy as an outcome of opening and economic reform. Economic opening and reform are inevitably followed by some negative effects on the traditional political system, and worst scenario could be a collapse of the regime. E.g. Vietnam would still exist, since there is not another Vietnam even in the worst scenario. The same holds for China as it is unimaginable for China

to be absorbed by Taiwan. Unfortunately, ROK is much stronger economically and politically.

Research has been conducted into DPRK's future development and several strategies have been suggested. Babson (2001) rationale DPRK's need to lower major cost factors, particularly transport costs. According to data from the Federation of Korean Industries, transportation accounts for 40 percent of total production costs. The costs of transporting a twenty-foot container from Incheon port in ROK to Nampo Port in DPRK are four times higher than the cost of shipping the same container to China. Herold (2002) recommended basic infrastructure projects (e.g. electricity and transportation) as one of the short term (two to five years) priorities for development of DPRK. The plan for infrastructure rehabilitation should be linked to overall macroeconomic policy. Transport strategies should be developed for rehabilitation of roads, ports and railways and projects should be prioritised. The government needs to address issues relating to intermodal coordination, planning and development to come up with a rational plan for sector development. On a wider scale, Jo (2004) suggested a development strategy for DPRK (Table 2.9). According to the vision of building an economically powerful nation, DPRK should alter its self-sufficiency food strategy by allocating fewer resources to food production, and substituting domestic shortages with imports. To secure supply of consumer products, DPRK should promote light industry in local areas and also improve distribution system of consumer products. It is Important to imitate technology from more-developed nations to enhance production technology. Infrastructure facilities can be improved through more effective logistics by balancing development among railways, highways, waterways and ports.

**Table 2.9 Development strategy of the DPRK economy**

The Vision	To build an economically powerful nation
The goals	To improve people's living condition To establish a foundation for growth <ul style="list-style-type: none"> <li>- sustain an annual growth rate of 7 percent</li> <li>- to reach per capita income of US\$1000</li> </ul>
The strategy	New Planned Economy for the 21 <sup>st</sup> Century <ul style="list-style-type: none"> <li>- allow market economy in the islands</li> <li>- uphold plan mechanism in the mainland</li> </ul>
The preconditions	Improve foreign relations Efficient and reliable leadership
The six major tasks	Increase food supply Security of consumer products supply Improvement of human capital Enhancement of production technology Enlargement of infrastructure Fortification of strategic industries

Source: Jo (2004)

Market reforms are slowly changing the face of DPRK society, most noticeably in the capital Pyongyang. On the streets, vendors are hawking fruits, kiosks sell the North's famous cold noodles and Internet café owners are soliciting business from foreigners (Lee 2005). In the northern part of the country, near the Chinese border, consumer electronics are penetrating the state's isolation. After DVD players swept northern China since 2005, entrepreneurs collected castoff videocassette recorders and peddled them into the country (Brooke 2005). In line with its reforms, the government adjusted the party's ranking system and relocated 30 percent of salaried party members to production facilities (Park 2005). The recruiting system for public officials has become more stringent. Applications have to pass economics and politics whereas in the past they were only required to pass an interview, in which they present other officials' recommendations. Younger technocrats in their 40s are now placed in charge of economic-related policy making bodies. Senior DPRK officials also received courses on multilateral diplomacy and market economy in Geneva (Yonhap News 2005).



## **2.5 Summary**

This chapter has presented a geographical overview of DPRK illustrating that due to its topography a majority of the transport network is concentrated on the east and west making it especially difficult for planners to develop an efficient and effective transport network in the country.

DPRK has been under the regime of Kim Il-Sung and his son, Kim Jong-Il since World War II. The elder Kim quickly established his own regime by eliminating opponents, who spoke out strongly against him. Juche was first introduced as an ideological principle and was later refined to provide guidance to economic and defence policies including transport and logistics. DPRK conducted very little foreign relations with western countries from 1950s to 1980s. The situation changed after the country appealed to the international community for aid in 1995 and 1996. However, foreign relations are still volatile as DPRK attempts to embrace a foreign policy which is out of touch with reality.

This chapter has presented an economic evolution of DPRK highlighting that its persistence in maintaining an autarkic economy throughout the last few decades has seen the country missing out on economic prosperity which ROK has enjoyed. The reliance on Juche ideology plunged the country into a serious economic crisis which was exacerbated by a series of natural disasters in the mid-1990s.

This chapter also discussed DPRK's attempts at reforming its economy with special economic zones, designed to boost foreign investment and earn hard currency. In July 2002, the DPRK government introduced a series of economic

reforms, which resembled a desperate attempt to narrow the gap between official and black market prices rather than opening up its economy. In the development strategy for DPRK, major cost factors, including transport, needs to be lowered. The government should devise a master plan for the rehabilitation of transport infrastructure.

The next chapter appraises the present conditions of transport and logistics infrastructure in DPRK, which are central themes of this research. It includes strategies and plans for future developments of the transport network and introduction of logistics concepts.

## **CHAPTER 3 – TRANSPORT, LOGISTICS AND LOCATING IN DPRK**

This chapter appraises the present conditions of transport and logistics infrastructure in DPRK, which are central themes of this research. It includes strategies and plans for future developments of the transport network and introduction of logistics concepts. It incorporates a discussion about the debate in the literature concerning the relationship between transport development and economic growth in any country.

The main objective is to discover from the literature whether the development of transport is likely to exert any major influences on the economic growth of DPRK or vice versa. It incorporates an overview of transport in developing countries to relate it to the transport conditions in DPRK. It discusses transport in the command economy of the Soviet-era, which is relevant because DPRK's structure was similar to the FSU.

This chapter also provides a brief overview of location theories from two dominant perspectives – international business and economic geography. It also discusses the various ways of classifying location factors, which might aid in developing a set of factors for analysing ROK's SMEs decisions to locate in DPRK.

### **3.1 Transport and Economic Development**

Transport is an epitome of the complex relationships that exist between the physical environment, patterns of social and political activity, and levels of economic development (Hoyle and Smith 1998, 13). The relationship between transport and development has been the subject of theoretical and practical

interest over the years sparking debate in the literature (Gauthier 1968; Goldstein 2001; Hilling 1996; Hoyle 1973; Simon 1996; Ullman 1956; Wilson 1973). Rostow (1971) believed that the development of transport networks was an essential precondition for economic development, a view supported by the work of Taaffe et al. (1963). Hoyle (1973, 50) also claims that the emergence of a viable and efficient system of modern transportation is clearly an essential element in the growing infrastructure upon which the expanding economies of the less developed countries must be based. Fogel (1964) argued that economic development in the 19th century United States was due more to technological innovations in manufacturing and agriculture and socio-cultural change rather than railroads. This was supported by the discussion in Hilling (1996), where a number of empirical studies during the 1960s and 1970s showed that there was no simple relationship between transport and development. Gauthier (1970) was more diplomatic when he distinguished three possible relationships between transport and development – positive, permissive and negative. Positive relationship occurs where an innovation in transport is responsible in a direct way for expansion of economic activity. There is a permissive effect when transport does not itself stimulate economic growth but is such that it does not inhibit such growth when other stimuli are operating. In a negative relationship, transport causes the possibility of an actual decline in per capita income of a country.

As a result of decreasing transports costs, transport rarely featured in studies of economic and regional development during the 1970s and 1980s (Pedersen 2001). Consequently, the debate was renewed in the early nineties as a result of globalisation and advances in transport. Leinbach (1995) highlights that in

less developed countries, up to 40 percent of public expenditure is devoted to transport infrastructure providing evidence of the important role of transport in development. This is supported by studies elsewhere. Buurman and Rietveld (1999)'s research on transport infrastructure and industrial location in Thailand found that there is an indirect link between transport infrastructure investments and growth of gross domestic product. Their findings conclude that roads and ports have a positive impact on industrial location, although the size is modest. Goldstein (2001)'s work on air transport infrastructure development in Sub-Saharan Africa displays similar characteristics. Démurger (2001) provides empirical evidence on the links between infrastructure and economic growth in China. The results indicated that transport facilities are a key differentiating factor in explaining a growth gap in 24 provinces. In contrast, Banister and Berechman (2001)'s research showed that transport infrastructure investment acts as a complement to other more important underlying conditions, which must also be met if further economic development is to take place. They further argued that a series of necessary conditions (economic externalities, investment factors and political factors) must be present to allow for economic development to take place and individually they will have little or no impact on development. This is underlined by Hilling (1996, 12) where the author concludes that development is based on a range of inputs (including transport) and is most likely to take place where these are considered not separately but as part of a package and planned in a coherent way. This is also the view of this research which seeks to ascertain the implications of economic and political developments on transport and logistics in DPRK.

### **3.2 Transport and Logistics Development in Developing Countries**

This section traces the links between transport and logistics development in developing countries. A majority of research on developing countries tends to be centered on Africa (Hoyle 1973; Hoyle et al. 1998; Pedersen 2001; Pedersen 2003; White and Senior 1983; and Taaffe et al. 1963) with very little in Asia. Research into logistical developments in developing and transitional economies in Asia has included focus on the challenges presented (Razzaque, 1997) or requirements for high-technological equipment and skilled labour personnel (Goh and Ling, 2003). Some of the common problems which plague most of these economies, especially in DPRK's transport system are:

- very large, congested and rapidly growing urban agglomerations with inadequate transport systems;
- poor quality, low capacity and badly maintained inter-urban transport infrastructure;
- high cost rural transport using poor quality roads; and
- inefficient railway systems requiring large government subsidy but providing a poor and deteriorating quality of service.

Present day transport and development patterns owe much to the emergence of a world mercantile system and the ensuing colonial period, which laid the foundations not only of the global links but also of the urban hierarchies that form the transport node (Hoyle and Smith 1998). It is worthwhile to briefly look at two models of transport development and determine their applicability to this research. According to Hilling (1996), many of the transport development models are designed to identify phases in the evolution of spatial organisation. Rimmer's model (1977), applied to Southeast Asian countries, identified four

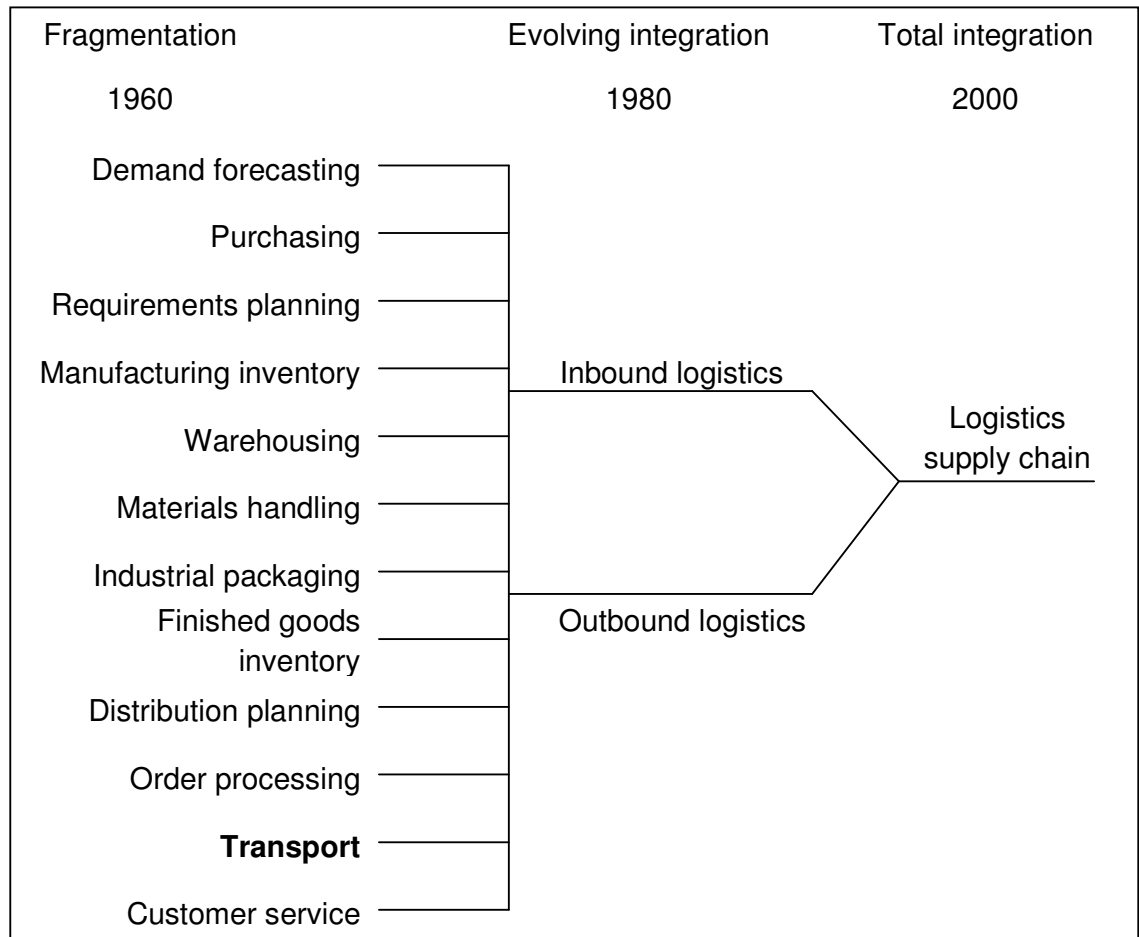
phases in the development of transport in less-developed countries. In his model, the starting point is a pre-contact phase in which there are no overseas, external links supported by a limited network of tracks, together with navigable waterways where there is a restricted socio-economic and political system. The early colonial phase involves establishment of direct contacts by sea between advanced and developing countries but not producing far-reaching changes in the Third World societies while the Europeans were content to dominate sea transport routes (Hilling 1996). The third phase of high colonialism involves more fundamental changes of roads and railways, port facilities and inland transport modes, establishment of political control and the diversification of economy activity. The fourth neo-colonial phase required modernisation of the transport system to adapt to demand. Taaffe et al's (1963) work on transport in the developing countries became widely accepted as a model of transport development for resource exploitation in Ghana during colonial and post-colonial rules. The model represents the parallel evolution of political, economic and transport systems in a developing country. Initially, a large number of small ports are established to represent initial points of political contacts and economic exploitation, and forms a basis for the introduction of inland transport modes (Hoyle and Smith 1998). As time passes, railways and roads are constructed and extended, linking the ports to their hinterlands. The connectivity of the network will gradually increase while some places will prosper, others will decline. Eventually, the last phase involves a fully integrated transport network corresponding to the development of a fully integrated national economy. Taaffe et al.'s model has been criticised in various ways. Hoyle and Smith (1998) argued that it is an oversimplification of reality and questioned its feasibility and relevancy to the demands and objectives of modern-day transport systems.

Pedersen (2001) revisited the model and discovered that the ports in Ghana remain the important focal points in the transport system and the integration of inland transport that was expected has not taken place.

In the midst of all the discussions, the development of transport systems has been influenced by the logistics revolution that during the last 30 years has led to structural changes in the global transport system. The advent of containerisation has changed the way trade is being conducted. The shipping industry, especially ports and shipping lines had to reinvent themselves (Notteboom and Winklemans 2001; and Robinson 2002). Focus has shifted away from individual modes of transport to integrated intermodal transport networks. With relatively low transport costs, the trend in international trade is leaning towards global sourcing of raw materials and international assembly of manufactured goods. Through the introduction of logistics concepts, transport has increasingly become an integrated part of the whole supply chain (see Figure 3.1). Supply chains encompass all activities (manufacturing, packaging, warehousing, distribution) associated with the flow and transformation of goods from raw materials stage through to end user, as well as associated information flows, financial flows and product flows in both directions. Despite the changes, transportation still plays an integral role in international logistics. The globalisation of the economy is based on the ability to transport goods around the world. Reducing the cost and improving the quality of transport and logistics system improves international market access and leads directly to increased trade and through this to higher incomes and the scope for significant reductions in poverty (Carruthers et al. 2002, 117).



**Figure 3.1: Logistics evolution to supply chain management**



Source: Coyle, Bardi and Langley (2003, 14)

Moving onto the discussion of logistics in developing countries, Wood et al. (1995) describe four key attributes of a “First World”, “Emerging” and “Third World” logistics system (see Table 3.1). Their “First World” includes countries such as the USA, Japan and the EU. Emerging nations include Taiwan, China and Brazil while Sudan, Afghanistan and Haiti constitute the Third World. Dadzie (1998) classifies Third World countries as those who resort to central planning mechanisms rather than free market forces to regulate the supply of goods and services, especially during periods of economic scarcity. Therefore it is reasonable to classify North Korea under the “Third World” category.

**Table 3.1: Regional differences in logistics attributes**

	First World	Emerging	Third World
Infrastructure	Highly developed	Under-development	Insufficient to support advance logistics
Supplier operating standards	High	Variable	Typically not considered
Information system availability	Generally available	Support system not generally available	Not available
Human resources	Available	Available with some searching	Often difficult to find

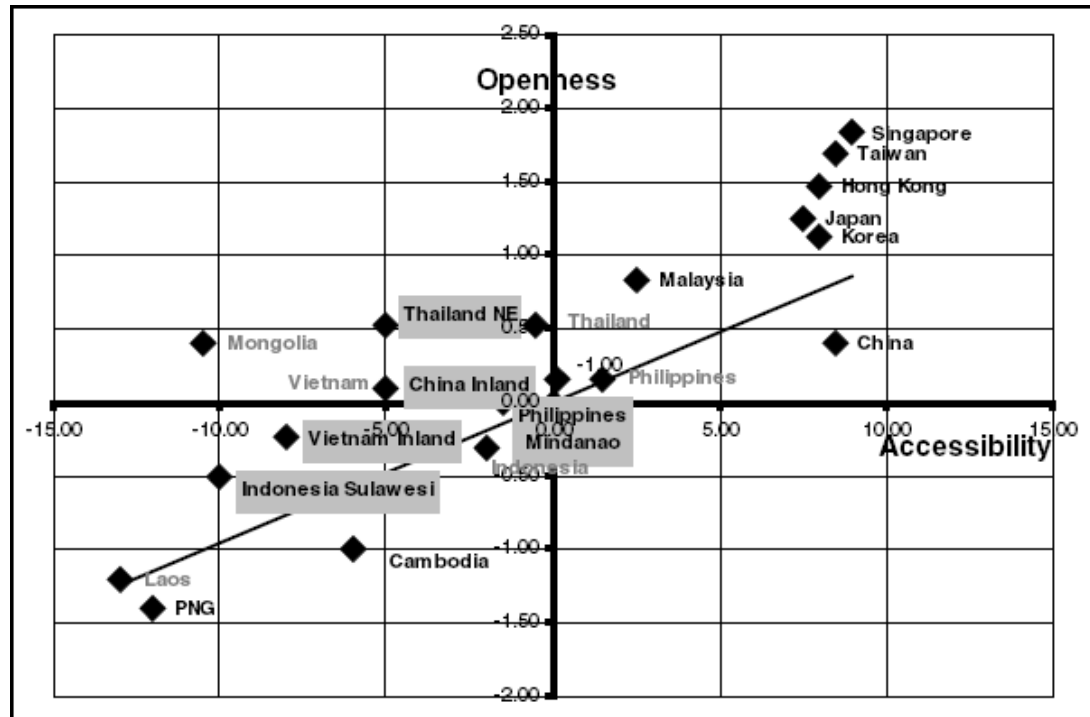
Source: Wood et al. (1995, 21)

The challenges that many developing and transitional economies face in developing their logistics systems are legacies of their past (Razzaque, 1997). These fundamental inherited problems also stem from a lack of understanding of the role and importance of logistics. Efficient distribution of products and services must also be supported by an efficient transport system. Dadzie's (1998) work on the transfer of logistics knowledge to Third World countries identifies several logistics characteristics that are also prevalent in DPRK today. In these countries, the economies reflect a sellers' market environment, i.e. fewer products and services are available than consumers want to or can absorb. This is true in DPRK with high prices and low wages. Governments exercise strong controls over many physical distribution activities, in most cases, delegating state agencies to perform these functions. Transport and warehousing facilities are subjected to government regulations and price controls. Optimum cost trade off logistics decisions are not possible. Existing transport infrastructure is constructed during the period of colonial rule for the purpose of exporting raw materials and transporting imports to major urban population centres. Delays are prominent in unloading and loading at the ports. Yoo and Rhee (2002) explored the practical problems and limitations of the

current supply chain of the enterprises that advanced into DPRK. Some of the problems they identified include: conveying goods from DPRK requires the approval of both governments; stringent customs inspection; management of companies in ROK to control the activities for the production and transportation in DPRK becomes difficult due to the lack of related information; and weak linkages among chains.

Carruthers et al. (2002) provided an East Asian (which includes China, ROK, Japan, DPRK and Mongolia) perspective to the relationship between trade and logistics. The authors concluded that East Asia's progress on logistics has failed to keep pace with its growth in trade. This justifies Bookbinder and Tan's (2002), research into Asian and European logistics systems when they found that research literature on international logistics has heavily emphasised the USA and Japan. Those countries were followed by UK, Australia and Canada. North America led in quantity, then Europe and finally the Asia Pacific, but logistics in the latter is usually discussed on a piecemeal basis. High logistics costs derive from poor transport infrastructure, underdeveloped transport and logistics services, and slow and costly bureaucratic procedures. Carruthers et al. (2002) suggested a way of organising thinking about logistics in East Asia by placing economies on a graph of trade openness and accessibility (See Figure 3.2).

**Figure 3.2: Potential contribution of transport to economic growth in East Asia**



Source: Carruthers et al. (2002, 119)

Those economies lying above the horizontal axis score high on measures of openness. The economies to the right of the vertical axis are accessible to world markets, in the sense of having superior logistics and low transport costs. The combination of these two measures groups these economies on the basis of their current logistics status, as well as on the value of improved openness and logistics services in the future. Two other additional variables are measured: per capita income and the commodity structure of trade. The economies in the upper-right quadrant enjoy higher incomes than those in the lower left and their exports are high-technology manufactures rather than resource-based commodities. According to the study commissioned by the World Bank, Singapore and Hong Kong, both of which score highly on openness and accessibility, have grown rich in part because of their past investments in superior logistics which have facilitated trade. In contrast, Mongolia, Laos and Cambodia still suffer from poor basic road access (Table 3.2). Naturally, given

the situation in DPRK one would expect the country's degree of openness and accessibility to be situated close to that of Laos or Cambodia. Jin's (2003) research on openness and growth in DPRK supports the notion of the state's closed economy. However, an anomaly arises when comparing DPRK's accessibility with that of Laos or Cambodia. DPRK has more basic road access, though the conditions of their roads are inferior to both countries. DPRK has longer railway tracks although this is understandable as railways were the main form of passenger and freight transportation under the centrally-planned economy. The author would argue that DPRK enjoys a fair degree of accessibility, possibly similar to Malaysia, though the present conditions of its transport infrastructure deter usage.

**Table 3.2: Availability of transport infrastructure**

	Total roads Km/1000km <sup>2</sup>	% of roads that are paved	Railways Km/1000km <sup>2</sup>	No. of airports with pave runways longer than 1523/1000km <sup>2</sup>
<b>Cambodia</b>	<b>78.6</b>	<b>11.6</b>	<b>3.3</b>	<b>22.1</b>
China	146.3	28.3	7.1	27.4
<b>Lao PDR</b>	<b>59.1</b>	<b>24.0</b>	<b>0</b>	<b>25.3</b>
Korea	888.9	74.7	31.7	375.7
Malaysia	196.1	75.3	5.5	63.7
Mongolia	2.2	46.1	1.2	4.5
Thailand	125.7	97.5	7.9	75.9
Vietnam	283.1	25.1	9.5	45.5
Argentina	78.6	29.5	12.3	32.8
Poland	1218.6	65.6	74.9	236.7
<b>DPRK</b>	<b>258.8</b>	<b>6.4</b>	<b>43.3</b>	<b>257.0</b>

Source: Adapted from Carruthers et al. (2002) and Author (2008)

### **3.3 Transport in the pre and post-Soviet-era**

This section incorporates an overview of transport during the Soviet-era to understand the conditions in a centrally-planned economy, which is relevant to present-day DPRK. Some of the solutions from the post-collapse era might be

applicable for the rehabilitation of transport and introduction of logistics concepts in DPRK.

The Soviet system, as mentioned in previous chapters, was developed on the basis of communist economics which was characterised by meaningless prices, uncalculated subsidy, artificial markets, unrealistic demand, a lack of incentive and a failure to recognise the significance of this within an international market (Roe 2001, 1). Industrial enterprises could not buy raw materials or sell finished goods without permission from the controlling body. One of the most important distortions was the hypertrophy of the producer goods sector and defence related industries at the expense of underdeveloped light industry and agriculture. Heavy and defence-related industries always had top priority as far as the rationed distribution of scarce materials resources at the highest political and/or administrative level was concerned (Rodnikov 1994).

Transport infrastructure had been poorly maintained as a result of higher-priority, competing demands placed upon scarce capital (Cullinane and Toy 1998). Railways were the preferred mode of transport of cargoes and passengers. In some countries, the development of highways was ignored (Buchofer 1995 and Skayannis and Skyrgeannis 2002). Waters' (1998) research on Poland's road transport identified several specific problem areas: poor organisation; industrial policy; lack of coordination; shortage of capacity; little profits; reduction in transport investment; aging vehicle fleet; poor access to roads; slow border crossing and high costs. According to Kim (2001), the sources of poor transport infrastructure include:

- a Stalinist accounting system which treats investment in transport and logistical services as a non-productive component;
- a lack of economic incentive due to low tollgate fees and port usage charges; and
- insufficient cooperation between different transport authorities due to jurisdictional conflicts.

Logistical systems in a centrally-planned economy are typically monopolistic with a single sourcing policy presenting little motivation to implement more effective or efficient methods for undertaking production or business. The quality of products is often poor and consumers are offered few alternatives. A centrally planned economy has also led to an irregular supply, causing production and distribution firms to maintain higher inventories (Vanden Bloomen & Petrov, 1994).

After the breakup of the FSU, there were distinct changes in the field of transport and logistics. According to Lijewski (1996), changes include:

- the type of goods transported;
- direction of international trade and transport; means of transport, with more emphasis on road and maritime transport;
- transformations in human behaviour including passenger traffic and an increase in international mobility; and
- transformations in ownership and share in transport business.

It would be reasonable to believe that DPRK will undergo similar gradual changes as it continues to reform its economy. The collapse of the FSU also

compelled former communist countries to restructure its transport and logistics infrastructure, with low cost efficient production the driver behind implementation of basic logistics practices in Bulgaria (Vanden Bloomen & Petrov, 1994) and privatisation, the main reform in Poland, requiring government to provide the right environment for restructuring the transport sector (Rydzkowski & Spraggins, 1994). Five years after the FSU collapsed, the Baltic States were struggling with deficiencies in a dilapidated transport network due to an inability to attract foreign direct investment for infrastructure (Buchofer, 1995). Russia learned that loosening state control without introducing market forces leads to chaos in the distribution of both producer and consumer goods (Rodnikov, 1994). These examples serve as initial lessons for DPRK, that it is important to install a proper institutional structure advocating cooperation amongst the relevant transport authorities and securing foreign investment to rehabilitate its transport network. One possibility could be securing development funds from international financial institutions such as the ADB, International Monetary Fund (IMF) and World Bank.

### **3.4 Overview of Transport and Logistics in DPRK**

DPRK's economy grew steadily after the Korean War in 1953 but stagnated since the mid-1970s, lacking in logistics facilities and infrastructure with a shortage of warehousing in industrial areas and poor connectivity between transport modes. Good logistics management requires effective and efficient networks of information and product flows, currently lacking, to facilitate distribution of products. Managers in DPRK do not possess the necessary logistics skills. Currently, logistics concepts are eschewed with transportation considered not as part of the social infrastructure, but as an element of



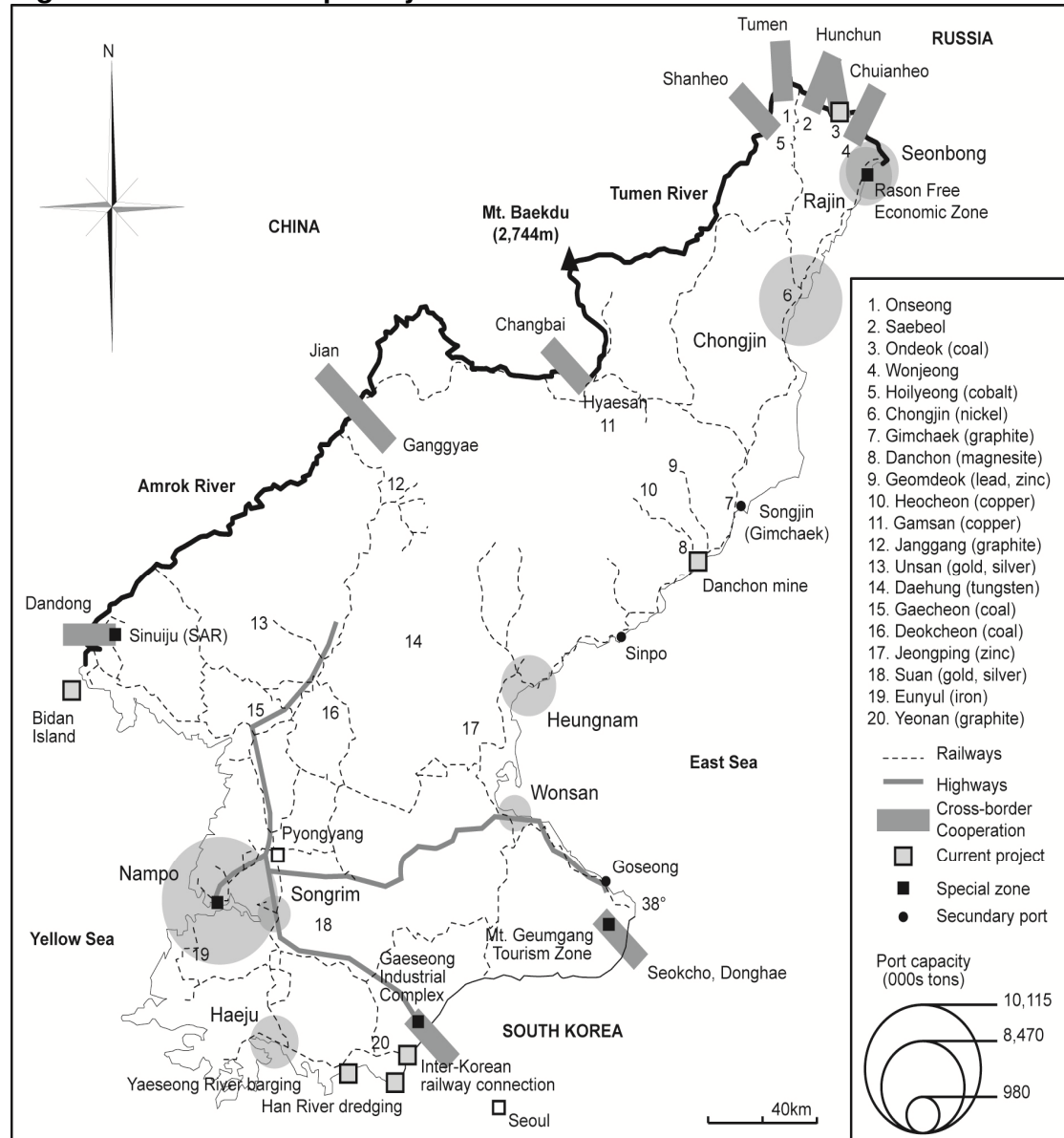
production, the purpose of which is to take care of the demand derived from other economic activities. This section reviews the present conditions of the transport and logistics infrastructure in DPRK. Due to its autarky economy, DPRK stopped publishing external statistics and information since the early 1960s. This posed problems on conducting any reliable research on the country. Data in the following sections are obtained from ROK and international institutions, which is considered the most reliable information available. Figure 3.3 presents an overview of the transport infrastructure in DPRK.

### **3.4.1 Railways**

Railways, the dominant transport mode in most communist countries, likewise forms a major part of the transport network in DPRK, linking all major cities and accounting for 90 per cent of cargo and 62 per cent of passenger movements (Library of Congress 2008) with 5,512 kilometres of track encompassing 60 main and local railway lines. Since 1958, 4,000km of track accounting for 79 per cent of the total rail network, which is higher than that of ROK, has been electrified to improve operations and overcome the difficulties in mountainous regions. Table 3.3 presents the major arterial railways of DPRK. The 1,435mm standard gauge, railway networks are H-shaped, consisting of east and west railways and railways connecting east to the west (Figure 3.4). With 98 per cent of the network being single track and dilapidated, it cannot be sufficiently utilised. The conditions of the rail beds, linear rails and rail tracks are so poor that the railways are known for their slow speed and low capacity (Kim et al. 2001, 28). The network primarily consists of routes from Kaesong-Sinuiju, Wonsan-Rajin and Pyongyang-Wonsan. For international routes, presently, the

rail link between Chongjin-Namyang-Tumen is used as a major route for freight movements with China.

**Figure 3.3: DPRK transport system**



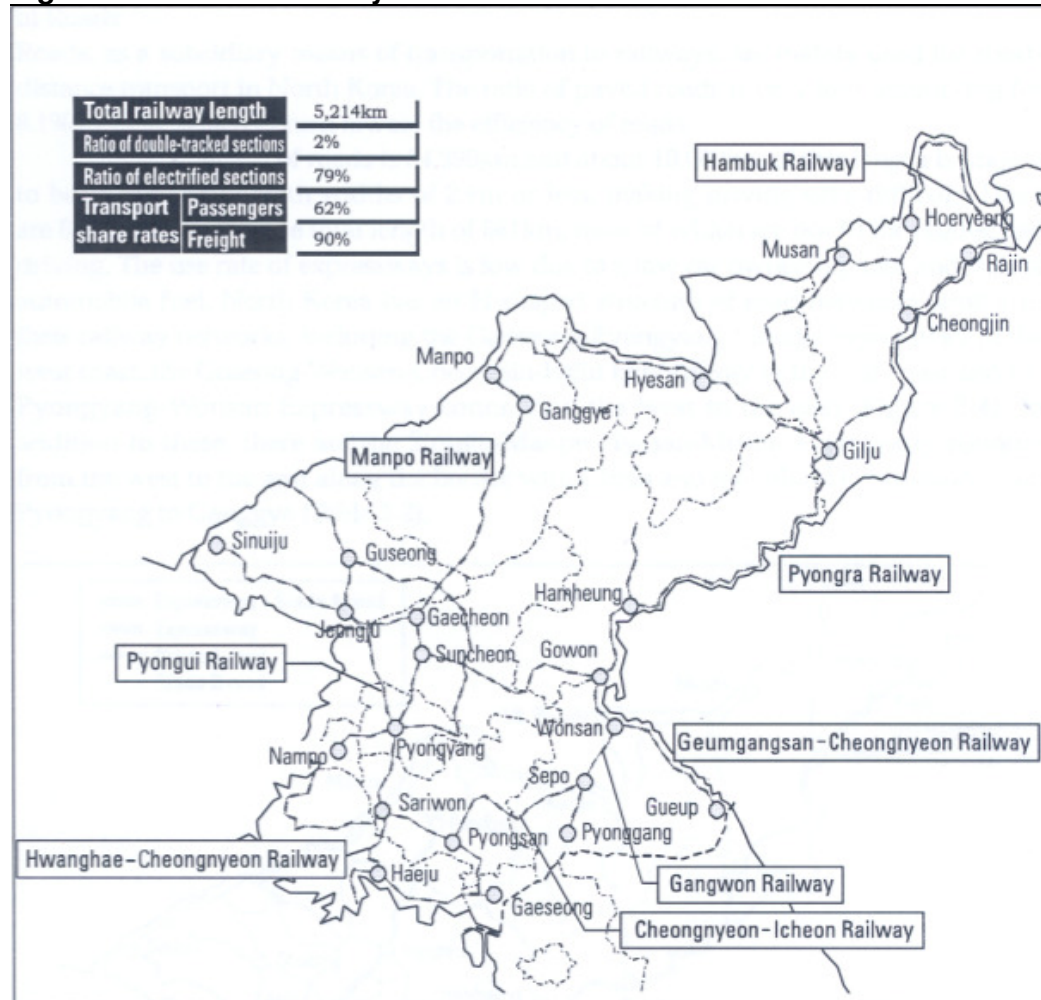
Source: Ducruet (2008)

**Table 3.3: Major arterial railways of DPRK**

Name of railways		Operating section	Total railway length (km)	Ratio of electrified sections	Ratio of double-tracked sections
<b>West railways</b>	<b>The Pyongui Railway</b>	Pyongyang-Sinuiju	225	100%	15%
	<b>The Pyongbu Railway</b>	Pyongyang-Kaesong	187	100%	-
<b>East-west railways</b>	<b>The Cheonnyeon-Incheon Railway</b>	Pyongsan-Sepo	141	-	-
	<b>The Pyongra Railway</b>	Ganri-Rajin	781	100%	-
<b>East railways</b>	<b>The Hambuk Railway</b>	Banjuk (Hoeryeong)-Rajin	327	-	-
	<b>The Gangwon Railway</b>	Gowon-Pyongyang	145	100%	-
	<b>The Geumgangsan-Cheongnyeon Railway</b>	Anbyeon-Gueup	102	-	-
<b>Inland railway</b>	<b>The Manpo Railway</b>	Suncheon-Manpo	303	-	-
<b>West circular railway</b>	<b>The Hwanghae-Cheongnyeon Railway</b>	Sariwon-Haeju	100	-	-

Source: adapted from Kim et al. (2003, 28)

**Figure 3.4: Arterial railways in DPRK**



Source: Kim et al. (2003, 29)

In June 2000, the historic summit between the leaders of DPRK and ROK, Kim Jong-il and Kim Dae-Jung, resulted in the idea of reconnecting the Trans-Korea Railway (TKR). Four TKR lines were constructed during the Japanese colonial period: Kyongui Line (Seoul-Shinuiju), Gyeongwon Line (Seoul-Wonsan), Mt. Gumgang Line (Seoul-Mt. Gumgang) and Donghae North Line (Samcheok-Anbyeon). Table 3.4 presents the inter-Korean railways reconstruction plan. Both Korean governments agreed to make the reconnection of the Kyongui Line the highest priority. Connecting the South-North transport network can turn both sides' weaknesses into strengths from which both can benefit (Yang 2002). According to Ahn (2002), if the railway and highway between the two Koreas

are connected, logistics costs will be reduced by 75 percent of the current level and shipping period shortened by 80 percent. This project has formed part of the catalyst leading to an increase in inter-Korean exchanges. Reconstruction commenced in September 2000, and ROK completed most of the construction on its side, 10km section excluding the 2km zone which is part of the southern portion of the DMZ (Ahn 2002). Other structures to be constructed include: two new stations, Dorasan station and Imjin River station; Customs, Immigration and Quarantine (CIQ) facilities; electrical power facilities and telecommunication and signal facilities.

**Table 3.4: Inter-Korean railways reconnection plan**

<b>Railways</b>	<b>Track sections to connected</b>	<b>Length (km)</b>	<b>Current Status (2010)</b>
Kyongui Line (Seoul-Shinuiju)	South: Imjin River-MDL North: DML-Kaesong	5.9 12.0	Completed construction of main tracks
Gyeongwon Line (Seoul-Wonsan)	South: Shintari-MDL North: MDL-Pyongyang	16.2 14.8	Land acquisition (1998)
Kumgangsan Line (Seoul-Mt. Gungang)	South: Chulwon-MDL North: MDL-Naekumgang	32.5 84.1	Railway drawing (1999)
Donghae North Line (Samcheok-Anpyun)	South: Kangrung-MDL North: MDL-Onjongri	127.0 18.0	Completed construction of main tracks

Source: adapted from Ahn (2002, 115) and Ministry of Reunification

The previous ROK government under Roh Moo-hyun had ambitious plans and hopes for railroads linking both Koreas. On May 14<sup>th</sup> 2007, Unification Minister Lee Jae-joung announced a three-step plan for the inter-Korean railroad (Ser, 2007). The first step includes connecting part of the Kyongui line from Seoul to Sinuiju to serve the Kaesong Industrial Complex. This enables raw materials and products to be sent in and out of Kaesong as well as allowing DPRK workers to commute to the industrial complex. The next step calls for expanding the use for business visitors and tourists visiting Kaesong to ride the train. Prior

to the reconnection of the railway lines, road transport was the only mode accessible. Finally, the plan calls for regular trips between Seoul and Pyongyang. Businesses would be aware that on December 11<sup>th</sup> 2007, North and South began limited yet historic cross-border freight rail links, connecting both countries for the first time in over fifty years. In the beginning, only one train a day carried goods to and from Kaesong. Due to low demand and the ongoing political tensions between both countries, rail links was suspended in 2009.

Longer term, optimists hope that this rail link is the first step of many to connect Asia through to Europe by rail. One potential future development includes UNESCAP's plans for a Trans-Asian Railway in the Northern Corridor of which DPRK has a major role in two of the five routes (Kyongui Line and Donghae Line). Reconnection of the TKR will not only establish a new transportation network that covers the Korean Peninsula but also the whole of Northeast Asia, creating the world's largest overland transportation route linking Asia to Europe. One suggestion is to create a daily rail connection from Finland – ROK, which would effectively link the European Union and Northeast Asia, bringing benefits to the Korean Peninsula (Heiskanen, 2003). This idea has been one of many which have been suggested by experts and academics. However, the possibility of this idea coming into fruition is low given the level of co-ordination required between the numerous countries and borders involved and also the problems involving the different types of rail gauges amongst countries and poor rail facilities in DPRK that needs upgrading, particularly the single line tracks.

Plans to connect the TKR and TSR to replace partial maritime shipments between ROK and the Russian Far East would permit cargo to be transported by rail from ROK to Europe (Tsuji 2005). In ROK's view, it would benefit China and Russia, bringing new economic opportunities and access to one of the largest natural resources reserves in the world respectively. DPRK will then serve as a transit point between the TCR in the west and the TSR in the north-east.

Since 2008, both China and Russia have staked interests in the Rajin-Sonbong SEZ located in the northern part of DPRK by rapidly constructing roads leading from their borders to the port of Rajin. Political-motivation rather than economic sensibility has led to both countries vying for territorial advantage close to their own borders. China hopes to divert the growing cargo traffic to its own territory, offering the efficient network of railroad for delivery of ROK and Japanese goods to Central Asian and European markets (Petrov, 2008). Russia has made more inroads into Rajin. In April 2008, Russian Railways and DPRK's Railway Ministry signed a contract for the reconstruction of the 55 kilometres Khasan-Rajin section that will link Russia's TSR railroad to the port of Rajin. Costing approximately US\$207 million, Eurasia's largest transcontinental railroad of over 10,000km will be established (Defense Technology blog, 2008). Transporting cargo from ROK – Europe takes approximately 14 days compared to maritime shipping which requires 45 days. Cargoes from ROK will depart through the port of Busan by ship to the port of Rajin or through Donghae railway line on the east coast to the port of Rajin where it will be transferred to Khasan and through the TSR to Europe. These projects are important to DPRK in many aspects (Bulychev, 2006). Firstly, it helps them to gradually establish

themselves as an important international transport hub, linking with countries like ROK, China, Russia and the EU. Secondly, the decrepit railways are upgraded by China and Russia without any investment required by DPRK. Thirdly, the additional revenue from transit charges would be widely accepted in DPRK. Lastly, the transit alternative is a good opportunity for Kim Jong-il to loggerhead China and Russia. Russia benefits from having a port which does not freeze during winter and it is also able to profit from the transit dues.

The reconnection of the TKR is said to bring the following benefits - reduced tension between both Koreas; lower logistics costs; increased direct trade in the region of US\$400 million; standardised facilities in both Koreas; and the promotion of inter-Korean economic cooperation (Yang 2002). However, these benefits have yet to materialise since the historic summits in June 2000 and 2007 as ROK continues to make concessions to DPRK without receiving any reciprocation in return.

Investment is essential to rehabilitate disconnected transportation routes, construct double track lines and modernise communication systems and equipment to enhance operational efficiency. The DPRK authorities have allegedly started preparations to reconstruct and expand the railway connecting Hyesan, Yangkang, Province and Samijyeon from a narrow to a broad railroad in preparation for 2012, the 100<sup>th</sup> anniversary of the birth of Kim Il Sung (Daily NK 2008). However, DPRK has no money to make any meaningful investment in the railway infrastructure. They have to continue to rely on external investment in the future.



### **3.4.2 Roads**

The development of roads in DPRK started after the Korean War. However, the closed economy, a lack of financial resources and mountainous terrain in most of the country constrained the road network. Thus road transport in DPRK has been neglected except in the capital city, Pyongyang, where many government officials reside. Roads account for less than fifteen per cent of national movements, with little investment. The total length of roads is 31,200km and about 10,000km of this length is known to be narrow roads with widths of 2.4m or less, making driving very difficult (Kim et al. 2002). The ratio of paved roads is only 6.7 percent, which in turn lowers the efficiency of roads. Unpaved roads are covered with gravel or crushed stones, or have dirt surfaces and are poorly maintained. With low personal spending power DPRK has only approximately 260,000 cars, most under the government control. Presently, there are five expressways built around the capital city. Roads are attracting increasing government attention with a national construction programme.

The major road network in DPRK consists of three main routes Kaesong-Pyongyang-Sinuiju (connecting with China) in the west coast, Gosung-Wonsan-Chongjin-Rajin (along the east coast), Nampo-Pyongyang-Wonsan (east-west crossing). Figure 3.5 presents the arterial roads in DPRK. In addition, there is the Sinuiju-Manpo-Hassan-Musan link running from west to east along the Korea-China border and the inland expressway from Pyongyang to Gangye. (See Table 3.5)

**Table 3.5 Main features of major arterial roads in DPRK**

	Sections	Length (km)	Width (m)	Pavement condition	Remarks
<b>Expressways</b>		<b>616</b>			
East coast axis	Wonsan-Goseong	114	12	Concrete	High speed road
East-West axis	Pyongyang-Wonsan	189	7	Concrete	4-5 lanes
West coast axes	Pyongyang-Sunan	15		Concrete+asphalt	
	Pyongyang-Nampo	53	7	Concrete+asphalt	4 lanes
	Pyongyang-Gaesong	170		Asphalt	4 lanes
	Pyongyang-Huicheon	120			4 lanes
<b>Arterial roads</b>		<b>3,158</b>			
East coast axes	Goesong-Onseong	867	2.7-7.3		
	Wonsan-Gimhaw	143	4.6-5.5	Unpaved	
	Cheongjin-Wonjeongri	113	4.7-7.3	Unpaved	
East-West axes	Pyongyang-Wonsan	197	7	Concrete	
	Shinuiju-Gomusan	861	2.7-6.1	Unpaved	
West coast axes	Gaesong-Shinuiju	461	4.9-7.3	Concrete	
	Sariwon-Haeju	72	5.2-7.6	Unpaved	
	Pyongyang-Nampo	53	5.5	Paved	
	Jeongju-Sakju	100	4.6-6.4	Unpaved	
	Anju-Manpo	291	3.7-4.9	Unpaved	
<b>Grade A roads</b>		<b>1,252</b>			Radial shape surrounding Pyongyang
East coast axis	Bukcheong-Hyesan	186	2.7-4.9		
East-west axes	Gaesong-Haeju	88	6.1		
	Geumcheong-DMZ	150	3.7-6.1		
	Pyongyang-Geumyaman	242	3.7-7.3		

Midland axes	Yangdoek-Pyongsan	145	2.7-4.9		
	Hoecheon-Yangdeok	58			
West coast axes	Pyongyang-Tosan	142	3.1-5.5		
	Jaeryeong-Nampo	47	5.5-7.6		
	Suncheon-Uiju.	194			
<b>Grade B roads</b>		<b>2,560</b>			Connected to Grade A roads

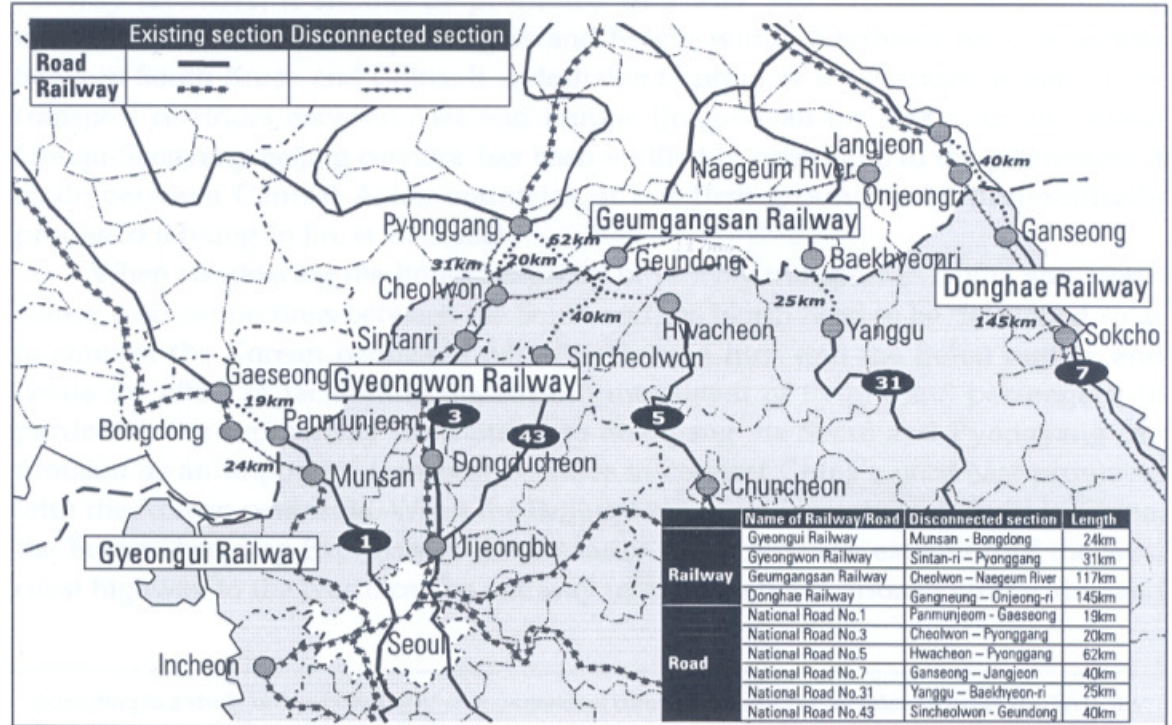
Source: Adapted from Kim et al. (2003, 31)

**Figure 3.5: Arterial roads in DPRK**



Source: Kim et al. (2003, 30)

**Figure 3.6 Disconnected land transport routes between South and North Korea**



Source: Kim et al. (2003, 38)

Figure 3.6 shows the disconnected land routes between ROK and DPRK. As part of the June 2000 summit, the rehabilitation of roads was one of the suggestions to improve inter-Korean exchanges. The Panmunjeon-Gaesong route attracted considerable interest from both sides due to the establishment of the Kaesong Industrial Complex. However, DPRK needs to take steps to reconstruct the disconnected route to improve the efficiency of roads.

As DPRK's trade with China gradually increases, the Dandong-Sinuiju and Wonjeong-Rajin routes will play an increasingly important role. According to Kim et al. (2002), foreign trucks are currently running from China to Rajin ports by this Wonjeong-Rajin road but due to its small capacity, it is known that it will not be able to meet future demands. The authors recommended that authorities place the highest priority on the construction of a new road between Wonjeong and Rajin. In 2007, China started to construct a new automobile highway from

Hunchun to the port of Rajin. In future, Sinuiju will be an important location for the creation of a special economic zone, similar to Kaesong. The merits of Sinuiju have already been mentioned in previous chapters. Therefore, it is important that the government provides adequate road access around the surrounding areas.

DPRK is part of the Trans-Asian Highway programme supported by UNESCAP. The project coordinates the development and upgrading of existing regional highways among member countries. Routes recommended for assistance were (see Figure 3.7):

- AH1: Seoul-Kaesong-Pyongyang-Anju-Sinuiju-Dandong (Border of China). This route provides links to the capital of China and ROK from Pyongyang
- AH6: Border of the ROK (near to Kaesong)-Wonsan-Sinp'o-Chongjin-Rason-Yanji (Border of China). This route provides a connection to the major seaports, industrial centres and access to seaports for eastern China.
- AH6: Pyongyang-Wonsan. This route provides a link between the two routes above.
- AH32: Rason-border of the Russian Federation. This route connects Khasan and Vladivostok.

Oh (2001) provided suggestions for future developments. As the economy grows, the government should prepare for rapid motorisation by building an expressway network to support truck movements and intercity passenger travel. Next, local road networks in cities and rural areas should be improved by

widening or paving them. Finally, the government should take advantage of low cost advances in transport technologies to improve the operational capacity of existing facilities without constructing new infrastructure.

**Figure 3.7: Asian highway routes in DPRK**



Source: UNESCAP (2001)

### 3.4.3 Ports

DPRK opened maritime transport routes with Japan in 1962 and with ROK in 1999. As DPRK traditionally only trades internationally with other socialist countries as there has been little need for investment in seaports and given the availability of rail and land transportation with China and Russia this has further reduced the need for seaports. Maritime transport accounts for under two percent of freight movements although humanitarian aid enters from ROK and

China through the west coast port of Nampo. Some conventional vessels are in service on the DPRK -Japan route. Two shipping lines of ROK are believed to be carrying containers on the Incheon-Nampo and Busan-Rajin routes. It is known that there are some services being offered to/from the Russian Far East ports such as Vladivostok and Nakhodka (UNESCAP 2005). DPRK has 22 ice-free seaports, including eight trade ports. Due to a lack of investment in ports, regular power failures result in slow unloading of ships and few ports can handle 40ft containers as there are no cranes available.

**Figure 3.8 Location of major ports in DPRK**



Source: CIA World Factbook (2008)

From Figure 3.8, the major ports on the west coast are Nampo, which lies on the Dandong River and connects directly to Pyongyang, and Haeju just south of Nampo. On the east coast, the major ports are Chongjin, Hungnam, Kimchaek, Rajin and Wonsan.

Nampo Port, a trading port and ship-repairing factory, has a total of ten large berths with a combined length of over 2km. They have five multipurpose cranes handling a wide range of cargoes from bulk cargoes to containers. Nampo handles ships sailing from China, Southeast Asia, the Middle East, Africa and Europe, as well as ROK. In 2003, DPRK announced that it is building its first container terminal with length of 200m and depth of 13m in the port thus enabling a more concrete trade route between Incheon in ROK and Nampo (Anderlini and Yan 2005). As Incheon is Seoul's maritime and air artery, it is envisioned that Nampo will play a similar role for Pyongyang. ROK manufacturing companies already based near Nampo are expected to benefit from this development. In January 2005, ROK's state-run Korea Container Terminal Authority concluded a joint venture with ROK's Kooyang Shipping Co. and DPRK's Dongnam Shipping Co. to be involved in the development of the container terminal. The joint venture company will be responsible for piers, a container yard, a container freight system and inland transportation from Nampo Port (Hand, 2005). In April 2008, a company, Acheon Global Corporation, run by the former head of Hyundai Asan Corporation, obtained exclusive rights to use the Ryongnam Ship Repair Factory in Nampo. This allows the company to gain businesses in its ship repair and steel-structure manufacturing businesses in DPRK (NK Economy Watch, 2008a). During the 2<sup>nd</sup> Inter-Korean summit, Nampo was one of the two areas earmarked for establishing shipbuilding areas. One of the major shipbuilders, Daewoo Shipbuilding, has plans to build a US\$150 million shipyard in the area. However, due to the dilapidated infrastructure, the shipyard will probably be in the form of a "block plant" – repairing vessels or producing components.



Haeju is a major port for DPRK's fishing fleet and navy and lies just 25 miles north of the DMZ. With a wharf length of 800m and depth of 7.0m, it has breakbulk and dry bulk terminal facilities, and berths for two 10,000 tonne vessels. During the 2<sup>nd</sup> Inter-Korean summit in October 2007, it was agreed between both leaders that Haeju will be developed into a special zone, similar to the Kaesong Industrial Complex. ROK experts have further suggested converting the area into a business hub comprising of a wide array of industries, from fisheries to manufacturing (Ko, 2007).

Chongjin port in the east coast has two main harbour areas; one specialising in coal and iron exports, while the other mainly handles imports of general and bulk cargoes. With floating and multipurpose cranes, container-handling is available at the port. DPRK hopes that either China or Russia will invest in the ailing port, which will hopefully serve as a transit port for cargoes going from Asia to Europe.

Hungnam, a small port on the east coast, is located 10km from Hamhung, DPRK's second largest city. It has minimal breakbulk and dry bulk facilities with fertilisers as its main cargoes. DPRK wants to modernise and open the port to expand inter-Korean economic exchanges. Pyongyang hopes to induce investment or reduce logistics problems in distributing aid shipments from ROK (NK Economy Watch, 2008b).

Kimchaek port lies between Chongjin and Hungnam ports. It has only one deep water berth of 9.8m which mainly handles timber cargoes. It was reported in October 2007 that Tangshan Iron & Steel Group Co. Ltd entered into an agreement to set up a 1.5 million-ton steel project in an industrial zone in the

east coast of DPRK, including Kimchaek port and Tanchon Port (SinoCast China Business Daily News, 2007). Although the specific location has not been mentioned, it is believed that the area nearby the zone has abundant natural resources, which China hopes to utilise as it is one of the top users of steel.

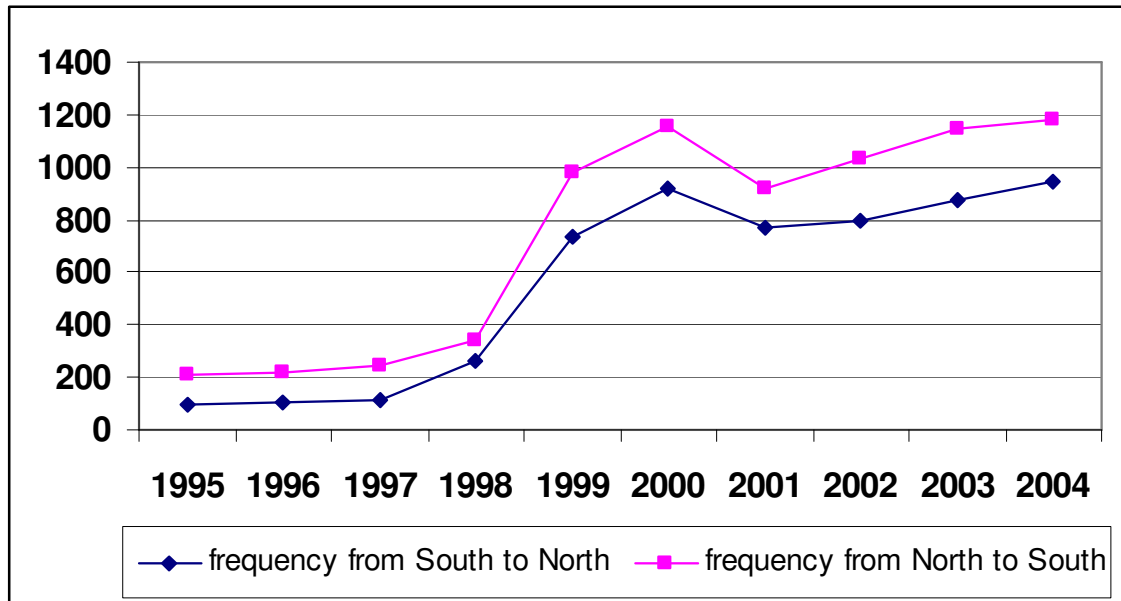
Rajin port, located at the Rajin-Sonbong FEZ, has 13 berths totalling 2,520 metres with a depth of 8-10.6 metres. Rajin is capable of accommodating ships of 5,000 to 30,000 tons class (Lloyds 2005) and handling from 3 to 3.5 million tons of trade, but its annual throughput is said to be less than 10% of its capacity (TREDA, 2006). As mentioned earlier, Rajin port is the subject of 'tussle' between Russia and China as both countries see the area as vital for the development of their own border regions. In October 2005, a Chinese investor concluded a 50-50 joint venture with the Rajin-Sonbong government for a 50-year lease to redevelop the port. Provisions include building and managing the road from the Chinese border of Hunchun to Rajin's port; renovating, upgrading and managing port facilities; developing and managing 5 sq. km. of land as a re-export tax free zone and the right to build and manage a tourist zone near the port with operations scheduled to begin in June 2007 (Anderlini and Yan 2005). Later in June 2007, DPRK inked an agreement with Russia to allow foreign ships to enter and leave the port of Rajin. Russia plans to use the port as the distribution centre of the Russian Far East (Donga, 2007).

Wonsan is a major naval port located in Kangwang province, with limited breakbulk facilities. There is a rail link to Pyongyang, though along with the rest of the country's rail network, it is in a poor state of repair and subject to long delays. Wonsan still has some activity due to being the major port for sailings to Japan (French 2005). There are major problems as Japan has placed

restrictions on DPRK vessels without valid ship insurance certificate. Prior to the ban, a ferry 'The Mangyongbong-92' used to have regular sailings from the port to Japan, often bringing in much needed valuable imports for local citizens.

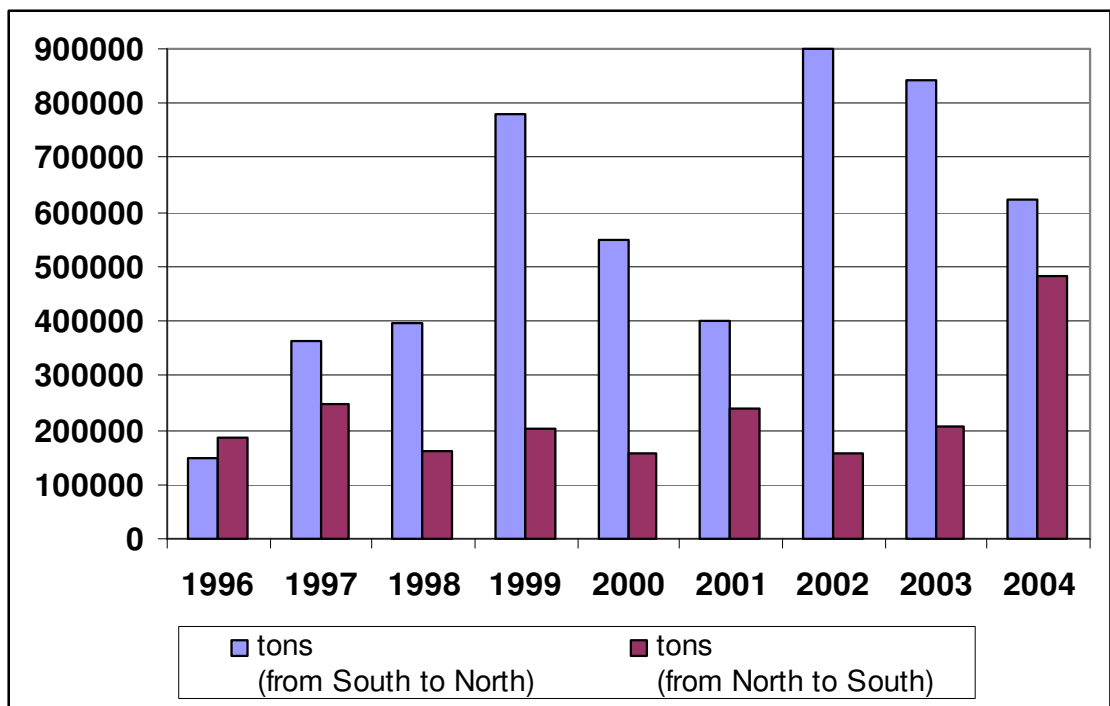
After the June 2000 and 2007 summits, both Koreas began to increase inter-maritime exchanges. A detailed review of the most recent maritime trade data available in 2004 shows that 2,124 vessels were used and a total of 1,108,057 tons of goods were traded (see Figure 3.9 and 3.10). The number of ships' voyages has increased steadily by 85 percent between 1995 and 2004. Another encouraging sign is the increase in volume of goods transport from DPRK to ROK. In 2002, the volume of trade was only 156,000 tons. Within two years, it grew more than three times to 483,000 tons. Most inter-Korean trade flows between the ports of Incheon and Nampo. The most common form of exchange between both countries is commission-on-processing trade. Since most processing plants are located near Pyongyang and Nampo, equipment and raw materials are transported to processing plants in DPRK and then finished goods are sent back to the ROK. Inter-Korean exchanges are expected to grow in the future which will have a positive impact on maritime exchanges between both countries.

**Figure 3.9: Number of ships' voyages between both Koreas**



Source: Ministry of Reunification (2006, 2)

**Figure 3.10: Volume of goods transported by ships between both Koreas (US\$ millions)**



Source: Ministry of Reunification (2006, 2)

The main problems for DPRK's maritime trade include the country's collection of exorbitant port-entry fees and poor quality of inland transportation within DPRK.

The route between Incheon and Nampo is circuitous, taking much longer than

necessary. According to Ahn (2002), the optimum shipping period for a round trip between Incheon and Nampo is six days. Currently such a trip takes ten to twelve days, and costs \$900/TEU, three times more than shipping costs on the Incheon-Tianjin route. Other bottlenecks identified include the lack of freight cargo base; lack of funds for infrastructure development; inadequate shipping and port capacity; lack of container handling capacity; and an inadequate maritime fleet. DPRK should seek to lower its port charges thereby attracting more cargoes through its ports. In addition, as ports provide a gateway to world markets and opportunities for access to trade with other countries, the maritime sector will be important in DPRK's future economic development and transition to a market economy. As demand increases, investment could be sought to redevelop ports, perhaps as private investment from international port operators such as PSA or Hutchison, or joint ventures with ports in ROK. Major benefits include transfer of technology and shared-investment costs. High priority might also be placed on improving transport links to the ports with many ports currently connected to the national railway system. The government could seek to improve road links between industrial areas and the ports.

#### **3.4.4. Airports**

In 2008, DPRK enjoyed 78 usable airports, 35 of which had permanent-surface runways. Soonan International is the only major international airport, linked to Pyongyang by a four-lane expressway. It offers about 20 flights per week on DPRK, Chinese and Russian carriers with an annual passenger capacity of about 20 million (Library Congress, 2008). Presently, airports are underused due to low demand. Direct flights from Singapore to DPRK commenced in July 2008, reflecting a growing demand for tours (Teo, 2008). Air travellers peak

during the Arirang Festival which runs about a month every spring and autumn. As the economy opens up and logistics develops, air transport will become more competitive and assist in development. There is potential for Soonan International Airport to develop as a major air logistics hub, but to attract major global logistics companies, requires improved terminal facilities and control systems. There is also a need to develop civilian airports in other major cities, such as Chongjin, Hamhung, Najin, Wonsan and Nampo, to cope with the potential demand from tourists, business travellers and home visitors.

#### **3.4.5. Telecommunications**

In DPRK, horizontal communication among households and businesses is still very limited, where civilian contacts with the Western world have been banned for a long time and secrecy is mostly welcome as a means to avoid criticism and preserve authority (Yoon and Lee 2001). There are only about 1.1 million telephone lines in use with 90 percent of domestic and international communications controlled by the government. The severe restrictions on civilian usage meant that any investment in telecom infrastructure had to be financed by the central government. As time passes, DPRK realised the important of information infrastructure. In 1998, the government announced that it had already established an optical-fiber backbone network linking 35 major cities and countries. This includes trunk lines from Pyongyang to Sinuiju and from Pyongyang to Kaesong via Sariwon (Figure 3.11). Cellular phones are being smuggled across the Chinese border in the north-west. Such developments will assist future development in logistics as information flow is considered an integral part of a supply chain network. In January 2008, Orascom Telecom, an Egyptian company operating throughout the Middle East



financial institutions such as the WB or ADB provide a majority of the financing? Which transport mode should get the priority? How is DPRK going to induce an increase in freight cargo base? What type of logistics concepts should be introduced in DPRK? What are the likely short, medium and long term strategies?

Social infrastructure investments are very capital intensive and require a long time for planning and construction. Development of transport and logistics infrastructure is based on comprehensive transport planning process. Both Ahn (2002) and Oh (2001) agreed that DPRK should develop a master plan that envisions a comprehensive transportation network for the whole of the Korean peninsula in light of possible reunification. The feasibility plan must take into considerations the current status of both countries' industrial base and future prospects; possibility of significant changes in industrial structure; economic viability of a transportation network and its influence on regional and local development. Active efforts should be made to standardise transportation and logistics systems between both Koreas. Ahn (2002) recommended that reorganisation of the transport network should be centred on a South-North axis connecting the Euroasia continent to the Pacific. Oh (2001) in his research to predict investment requirements of transport infrastructure, investigated the trend and performance of ROK's transport investments over the past 20 years. This approach, not using scientific demand modelling, was based on the assumption that there is a close relationship between economic growth and transport development. The study compared trends in population and GNP of the two Koreas. Using trend data for the past 30 years, the study assumes that



the state of DPRK's transport infrastructure in terms of capacity and motorisation level at that time was similar to that of ROK's in 1975 (Table 3.6).

**Table 3.6 Stock of Transport Infrastructure in both Koreas**

Mode & Item		Year	North Korea	South Korea				
			1996	1975	1982	1986	1993	1996
GNP	GNP (bill. \$)		21.4	20.9	71.3	128.9	330.8	480.4
	GNP per Capita (\$)		910	594	1,824	3,110	7,513	10,548
Road	Total Length (km)		23,369	44,905	53,935	53,654	61,295	82,342
	Paved (%)		10.7	26.9	35.8	54.2	84.7	72.7
	Expressway (km)		682	1,142	1,245	1,415	1,602	1,886
Rail	Total Length (km)		5,112	5,618	6,045	6,324	6,517	6,559
	Electrified (km)		4,030	424	428	441	530	577
	Double Track (km)		n.a.	563	714	773	852	901
Port	Cargo Handling Capacity (10,000tons/year)		3,501	3,164	9,600	15,401	26,894	29,526
	Container Cargo Handling Capacity (10,000 TEU)		n.a.	38	59	105	207	341
Airport	Handling Capacity – Passengers (10,000 persons/year)		2,000	n.a.	n.a.	9,031	43,138	64,210
Number of Vehicles by mode	Motor Vehicles (1000)		269	194	647	1,309	6,274	9,553
	Locomotives		1,153	793	1,004	1,162	1,851	2,194
	Passenger Wagons		1,045	1,717	2,152	2,213	1,921	1,900
	Cargo Wagons		21,271	15,866	16,702	15,858	16,238	14,048
	Ships (10,000tons)		92	208	565	665	638	699
	Civilian Airplanes		21	75	102	109	188	245

Source: Oh (2001)

Ahn's (2002) research assumed two scenarios for DPRK's future development:

(1) high economic growth – optimistic and (2) low economic growth – pessimistic. For the first scenario, if DPRK reaches 70 percent of the 1996 GNP level of ROK around 2020, the total financial requirement for DPRK's transport

infrastructure development of the next 20 years is estimated to be around US\$40 billion. In the low growth scenario, estimated costs will be US\$28.5 billion. Comparing DPRK's 1996 and 2004 stock of transportation infrastructure: GNP and per capita income is very similar, with GNP of US\$21.4 billion in 1996 and US\$20.8 billion in 2004, and per capita income of US\$910 in 1996 and US\$914 in 2005. However, transportation stock has continued to grow since 1996. Therefore, the projected stock of transport infrastructure in DPRK is not accurate (Table 3.7). As such, it is perhaps important to recalculate the investment requirements of transport infrastructure and develop scenarios that are similar to Oh's (2001).

**Table 3.7 Projected stock of transport infrastructure in DPRK**

Mode		Target Year	1996	2005	2010	2015	2020
GNP (billion \$)			21.4	70	120	150	330
Number of Motor Vehicles (10,000)			27	65	150	350	600
Road	Total Length (km)		23,369	40,000	50,000	56,000	61,000
	Paved (%)		10.7	30	50	70	80
	Expressway (km)		682	1,000	1,400	1,500	1,600
Rail	Total Length (km)		5,112	5,600	6,000	6,300	6,400
	Electrified (km)		4,030	4,500	4,800	5,040	5,120
	Double Track (km)		n.a.	400	700	800	850
Seaport	Cargo Handling Capacity (10,000tons/year)		3,501	9,000	15,000	22,000	26,000
	Container Cargo Handling Capacity (10,000 TEU)		n.a.	50	100	150	200
Airport	Terminal Capacity (10,000 passengers/year)		2,000	3,500	5,000	10,000	15,000
Target Investment (billions \$)			-	7.76	8.27	16.01	10.60
		Cumulative	-	7.76	16.03	32.04	42.64

Source: Oh (2001)

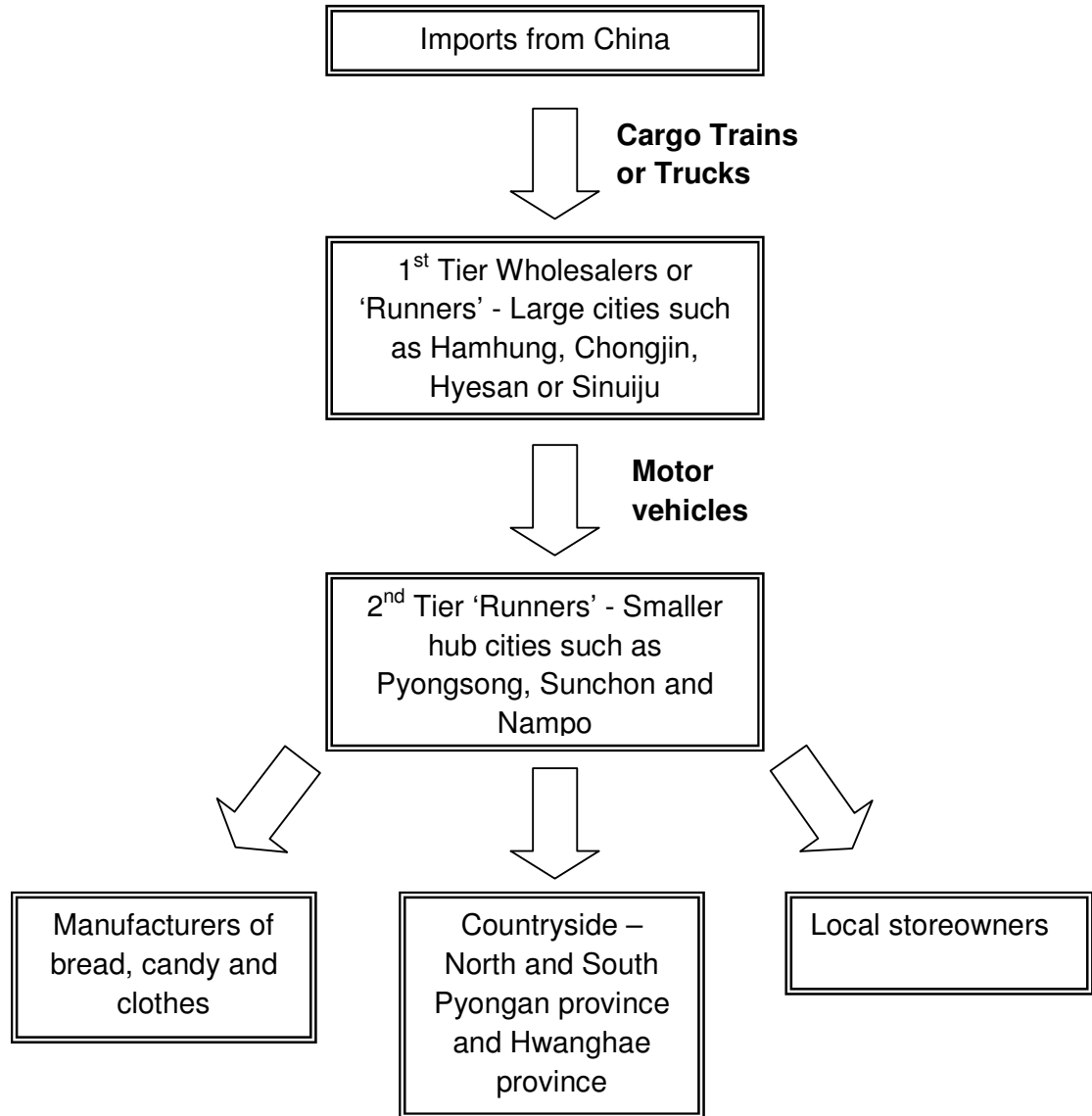
At present, logistics in DPRK is still in its infancy. They rely most on processing-on-commission trade. This means that raw materials or work-in-process goods are sent from ROK to DPRK for partial or final assembly before shipping back to the South for export to foreign countries. It was reported that Samsung

Electronics has been outsourcing production of 200,000 cathode-ray colour television sets per year to a DPRK electronics maker (Ahn, 2008). Gradually, more companies are moving beyond the Kaesong Industrial Complex. A food maker, Maniker, one of leading chicken-processing companies in ROK plans to set up farms beyond the DMZ, located between Sariwon, south of Pyongyang and Samilpo, which is near Mt. Gumgang (Han, 2007).

Logistics and distribution activities can also be seen in the daily lives of DPRK people. Since the July 2002 economic reforms where DPRK implemented a series of changes resulting in inflation of prices in goods, illegal markets have become a vital part of people's life. From personal observations in the DPRK-China border-crossing in Dandong and through speaking to private sources, the DPRK market system operates from general markets in big cities down to the small local markets in remote countryside with brokers in between (see Figure 3.12). First tier wholesalers or 'runners' import goods from China through Dandong or Sinuiju into large cities such as Hamhung and Chongjin using cargo trains or trucks. Second tier 'runners' go to these cities to purchase these products and bring them back to smaller hub cities such as Suchon and Nampo using motor vehicles which are often rented. Goods are then distributed to local store owners, manufacturers or sold to 'third runners' who come from the countryside. DPRK authorities have allowed these private markets to continue as it has continued to ensure the survival of the citizens in the absence of official markets as DPRK continues to rely on aid from foreign countries. Hence, these private markets are playing an important role in the country. Logistics and distribution activities are not customer driven, as the products are 'pushed' down the process chain. Import of goods from China depends on the ability of

first tier 'wholesalers' to gain permits from the authorities, which are not guaranteed.

**Figure 3.12: Distribution flow of imports from China**



Source: Author

### **3.6 LOCATING IN DPRK**

Foreign investors have to decide where and how to set up their operations. Location choices have been regarded as a major determinant of firm's performance (Li 2004 and Yamawaki 2006). Prior studies are dominated by two major approaches to explain the choice of foreign direct investment, one by scholars in the international business field and the other by those in economic geography (Nachum 2000). In the current research, much discussion has centered on multinational enterprises (MNEs) (Ruzzier et al. 2006). In recent years, more emphasis has been placed on SMEs and their entry strategies (Nakos and Brouthers 2002; Mazzarol and Choo 2003; and Aidis 2005). Much discussion has also focused on enterprise investment decisions in emerging economies such as China and Vietnam (Liu et al. 1999; Zhou et al. 2002; Cheng and Stough 2006 and Kawai 2009). However, very little research has been conducted into the location decisions of enterprises in DPRK, which mainly comprises of ROK and Chinese companies.

#### **3.6.1 Selected Theories and Models**

Firm location has been studied in various disciplines. An in-depth discussion can be found in Li and Park (2006) and Nachum (2000). The traditional approach taken by international business scholars focused on immobile production factors such as land, labour, raw materials or location. This concept was extended from tangible to intangible factors, including cultural and institutional framework (Li and Park 2006). Research in economic geography focused on the geographical proximity of firms rather than the differences between locations. The clustering of firms in a specific location brings more advantages and attracts more firms to that location. In the evolution of location

research, international business scholars began to incorporate the research of economic geographers into their studies of location choice. For example, Nachum (2000) integrates location advantages and agglomeration economies to develop a model for inward FDI.

Dominant theories in MNEs location research include the internationalization theory; the transaction cost theory; Dunning's OLI framework (also known as the eclectic paradigm) and the monopolistic advantage theory (Ruzzier et al. 2006). Much debate has been generated on the suitability of applying models of large firms' location choices to SMEs. Using Dunning's eclectic framework, Nakos and Brouthers (2002) examined SME entry into Central and Eastern Europe with results showing that the framework was highly applicable. The following section will be devoted to a discussion of Dunning's OLI framework, in particular location factor which plays a crucial role in the research into ROK SMEs and logistics companies location criteria in DPRK.

The OLI paradigm contains three sets of advantages: ownership, location and internalisation (Agarwal & Ramaswani 1992; Dunning 1981 and 1993; and Brouthers et al. 1999). These three sets of advantages take into account firm specific and market specific factors that influence perceptions of risk and the related potential return on investment, as well as influencing firm level resource commitment and desire for venture control undertake by a firm when it makes an entry mode decision (Nakos and Brouthers 2002). According to Dunning (1993), the internalisation of economic activity is determined by the realisation of the three types of advantages. First, ownership advantages are specific to the company and relates to the increase of intangible assets and intellectual property rights. Second, internalisation advantages stems from the ability of the

organisation to coordinate activities in their internal value chain (Ruzzier et al. 2006). Third, location advantages refer to institutional and productive factors present in a particular geographical area. Meyer and Nguyen (2005) commented that recent research has focused on the O and I aspects while ignoring the L factor. Dunning (1998) called location 'the neglected factor of the OLI paradigm'. The next section will focus on location advantages and factors relevant to it.

### **3.6.2 Factors Relevant to International Location Decisions**

Enterprises entering new foreign markets have to consider a wide range of factors when determining their location choices. A summary of factors influencing location choices can be found in Appendix I. They face various types of risks such as political, economic, foreign exchange and social environment. Political instability, especially in hostile countries such as DPRK, may create problems such as trade controls, currency restrictions, new regulations and unexpected changes in labour and tax laws, making difficult for foreign companies to operate profitably (Erramilli et al. 1997). Hence, location advantages may include the (i) size and potential of a market and (ii) the political, economic and social stability and policies of the host nation. Traditional location advantages also include market attraction, labour costs and physical infrastructure (Meyer and Nguyen 2005). Dunning (1993)'s work supports the above notion by emphasising on the following four sets of factors as the locational determinants of FDI: market-related factors, labour cost, transportation infrastructure and government policy. A large market size enables economies of scale and potentially high revenue. Labour cost factor such as high wage rates may deter FDI flows. Transportation infrastructure,

which includes the availability of roads, railways, ports, and other facilities, is crucial to production efficiency. However, in an autarkic country like DPRK, transport infrastructure is not part of the planned economy.

Government policy, in the form of formal and informal institutions, greatly influences location choices. Roe's (2001 and 2003) research into shipping in the FSU, grouped those factors under ten main headings: economic, social, political, legal, organisational, managerial, environmental, spatial, logistical and technical. DPRK does not possess any formal institutions that govern the legal environment when conducting businesses in the country. This poses risk to companies who are looking to invest in DPRK.

Location factors can be classified under four broad ways, among others: (i) Formal and Informal; (ii) qualitative and quantitative; (iii) supply side and demand side; (iv) export and market oriented.

The importance of institutions is increasingly important in the study of location choices in particular in transition economies. Meyer and Nguyen (2005) analysed how institutions in an emerging economy influence entry strategy decisions. Results showed that local institutional variables significantly influence the location decisions of FDI in Vietnam. Li and Park (2006) also found that institutional changes (open policies, privatization and legal development) have positive effects on FDI location. According to institutional theory, institutions are defined as the rule of law, which govern social, political and economic interactions between multiple actors seeking their own interests and benefits (North 1990 and Scott 1995). Kawai (2009) found that institutions such as special economic zones (SEZs), protection of intellectual property rights and



weak concentration of state-owned enterprises (SOEs) act as crucial determinants of recruiting Japanese manufacturing FDI into China during the late 1990s. According to North (1990), institutions can be divided into *formal* and *informal* constraints. Formal constraints include political, economic, and regulatory rules and contracts while informal constraints include traditions, cultural values, corruption, and ideology. Aidis (2005) classified formal constraints as high taxes and ambiguity of tax policies while informal constraints are implementation of business regulations, and national and regional governmental corruption.

Location factors can be classified under quantitative and qualitative factors. There has been criticism on the sole use of quantitative factors to establish location choices. Czumanski (1981) expressed his concern that most location decisions should involve more than the costs factors. Bhatnagar and Sohal (2005) further support the notion in their research on supply chain effectiveness. They added that existing literature tended to predominantly emphasise quantitative factors such as transport costs, exchange rates, labour rates and taxes. Schemenner (1979) advocates those views and states that cost can be estimated through any quantitative analysis and should definitely consider the intangible and qualitative factors. Bhatnagar and Sohal (2005) listed eight groups of qualitative factors: cost, infrastructure, business services, labour, government, customer/market, supplier/resources and competitors. MacCarthy and Atthirawong (2003) identified 13 groups of major factors which include social and cultural factors, government and political factors, economic factors, legal and regulatory framework, infrastructure, proximity to suppliers, customers, parent company's facilities and competition, labour characteristics and costs. In

DPRK where accurate measures of costs are difficult to obtain, it is difficult to conduct any purposeful research on location choices based solely on quantitative factors. Hence, it would be worth considering the use of both quantitative and qualitative factors in ascertaining ROK's SMEs location decisions.

Urata and Kawai (2000), in their research on Japanese manufacturing SMEs undertaking FDI in Asia classified their group of location factors into supply-side and demand-side. Supply-side factors include abundance of low-wage labour, availability of good infrastructure, and good governance while demand-side factors include presence of sizable local market. Japanese SMEs regard industrial agglomeration, which has element in both supply and demand factors, as an important criterion when pursuing FDI.

Location choices can be classified into market oriented and export oriented factors. According to Asiedeu (2002), the main objective of market-seeking FDI is to serve domestic markets while for market-seeking FDI goods are produced in home country and sold abroad. The research suggests that FDI in small and poor countries is less likely to be market seeking. This is true for DPRK where its per capita income is low and distribution network is dilapidated. Zhang (2001) in his study of FDI in China classified export oriented factors as labour cost, transportation conditions, favourable fiscal policies, low land fee and market oriented factors as access to local markets, level of skilled labour and good infrastructure.

### **3.7 Summary**

This chapter discussed briefly the relationship between transport and economic development. It reviewed transport and logistics development in developing countries referencing to several models of development. It also showed that transport has developed and become part of the whole supply chain. This chapter further examined the problems and conditions of transport and logistics in the FSU prior to its collapse and in the new economies to provide an understanding of the current situation in DPRK.

This chapter also provided a detailed background on the present conditions of transport infrastructure in DPRK and strategies for investment. It showed that there is a need to re-appraise and prepare a comprehensive transport and logistics road map for DPRK. As with other former centrally planned economies, DPRK has huge potential to develop logistics facilities and systems. DPRK will need assistance from academics and researchers, the private sector, regional and international agencies, and government. Academics can offer ongoing research into improving logistics planning and systems. The private sector provides technology and skills transfer through investments. Regional and international agencies such as the ADB and UNDP can provide monetary assistance for developing infrastructure and training and educating managers. Government must reduce bureaucracy whilst maintaining an effective institutional and organisational structure.

This chapter also presented the types of quantitative and qualitative factors that might be considered when generating the factors that will affect the location decisions of ROK SMEs in DPRK.

The following chapter presents scenarios of DPRK, which focus mainly on issues such as politics, economics and nuclear weapons. Transport is rarely mentioned in those scenarios although transport infrastructure plays an important role in a country's economic development. Hence one of the objectives of this research is to develop transport scenarios for DPRK.

Reviews have also examined the conditions of transport and logistics infrastructure in DPRK and evidence from literature shows a positive relationship between the level of transport development in a country and its level of economic development.

## **CHAPTER 4 – SCENARIOS OF DPRK**

The preceding chapters have analysed the economic conditions and history of DPRK and determined that its economy is teetered on the brink of collapse. They have also examined the conditions of transport and logistics infrastructure in DPRK and evidence from literature shows a positive relationship between the level of transport development in a country and its level of economic development.

This chapter considers the use of scenarios within the broader context of different levels (i.e. supranational and national) of planning, and the narrow context of transport planning in order to aid in developing composite scenarios for the future development of transport and logistics in DPRK. As stated by Pearman (1988, 24),

“As a starting point for the preparation of transport planning scenarios, a first check should be on whether there exist any relevant higher-level scenarios within which the transport scenarios should fit.”

This chapter will analyse DPRK scenarios which are found in the literature which has mainly concentrated on the overall scenarios of the country in terms of maintaining a status quo position; a collapse in the event of a military coup or citizen uprising; and a peaceful reunification with ROK. Additionally, Appendix II provides an overview of the concepts and theories of the scenario planning approach.

### **4.1 Use of Scenario Approach in Country Analysis**

Scenario planning has been used widely to help countries look ahead into the future, between five to twenty-five years into the future. It serves as a useful tool

to aid governments in making the appropriate decisions in terms of economic, political, social and technological planning. This section looks at some examples of:

- Countries facing a crucial period of change in their history (the FSU and Hong Kong);
- Environmental analysis of countries' development at national and supra-national level (Australia, China, Ukraine and the EU)
- Countries seeking integration and peace (South Africa, Pakistan, India and the Middle East);
- Countries facing political changes (Thailand and Bolivia); and
- Countries planning economic changes (Africa, North Cyprus, Columbia, and the USA)

These examples would be appropriate to DPRK which is facing a crucial period of changes and instability mainly due to the issue of succession of Kim Jong-il, who has been reported to have undergone a serious operation at the end of 2008 and the issue of weapons of mass destruction. At the same time, ROK is seeking reunification with DPRK hence examples of integration and peace would be appropriate.

#### **4.1.1 Disintegration or Reunification Scenarios**

Scenario planning has been applied at critical periods in a country's history. This section looks at scenarios of the FSU which are particularly relevant in the context of DPRK who are experiencing similar conditions with uncertainty surrounding the country. In 1990, an important event occurred which changed the face of the world – the collapse of the Former Soviet bloc. Academic and

political experts began to ponder the future of the Soviet Union. Earlier before the collapsed, Simanovksy and Ushkalov (1990) accessed the underlying trends of the situation in the Soviet Union and presented three scenarios for the development of the Soviet society. The first scenario, 'shock therapy' or 'Polish scenario' envisage the formation of a multiparty system. Scenario II – the 'Yugoslav scenario', pictures a radical transition to a planned-regulated socialist market economy. The last scenario presents alternatives for a non-market development, making cosmetic repairs without any essential changes of the system. Moving on, Van Zon (1992) and Remes (1992) researched on the changes in Central and East Europe respectively after the collapse. Van Zon's analysis focused on three countries, i.e. Hungary, Czech Republic (then Czechoslovakia) and Poland on a 15-20 years time scale. He constructed five scenarios (see below) highlighting the driving forces within the region.

- i. Capitalist scenario – introduce market economy with the State playing a regulatory role;
- ii. Populist-authoritarian scenario – government strives towards introduction of market economy but highly secluded from the world market;
- iii. Leaning-upon-the-West scenario – heavily relying on the European Community and International Financial Institutions like IMF and European Bank for Reconstruction and Development (EBRD);
- iv. Sustainable Development scenario – well-being of future generations
- v. Muddling On scenario – half hearted reform policies and slow progress towards market economy.

Remes (1992) analysed the future developments of East European countries after their collapse. Using a time scale of 15 years, he began with intuitive

methods through informal discussions with experts in East Europe. Proceeding on, through interviews and literature reviews, different factors influencing East European futures were identified. Five based scenarios were developed – (i) positive integration into the European Union (ii) German dominance in the EU resulting in a German-dominated East Europe, which will provide little incentive for alternative Western investments (iii) ‘Blocification’ leading to internal social and political instability and (iv) general international crisis developing out of an international economic recession thus leaving East Europe without any economic aid and leading to collapse; and (v) catastrophe in USSR. Of these five scenarios, the one that most resembles the majority of the present East European countries is scenario one where East European countries like Estonia, Latvia, Lithuania and Poland have integrated into the larger EU. However, political instability is still inherent within some of these countries. Blanning and Reinig (1998) presented scenarios for Hong Kong assessing the impact of reunification with the People’s Republic of China. Their work focused on the position of Hong Kong as an international business hub. Their scenarios were constructed using an ‘Event Matrix’, calculating the probability of the event occurring and the degree to which the event is unfavourable to an organisation, industry or country. Three scenarios - optimistic, pessimistic and realistic, were developed. However, their study did not provide a time-frame for the likelihood of the events occurring. As such, it is difficult to assess their scenarios.

#### **4.1.2 National and Supra-national Development Scenarios**

This section discusses scenarios of countries which have assessed their long term future and sustainable development using environmental analysis at a national or supra-national level. Galer (1982) reported that Shell Australia was



commissioned to conduct a study into the long-term economic, social, political and technological changes affecting Australia. Their team comprising of academics, consultants, government officials, and industry experts conducted surveys and carried out interviews in each of their own expertise areas before integrating the work together. Two scenarios were developed – ‘Libertarian Alternative’ and ‘Mercantile Trend’, one being the most plausible scenario, the other a more conservative assessment of the future of Australia.

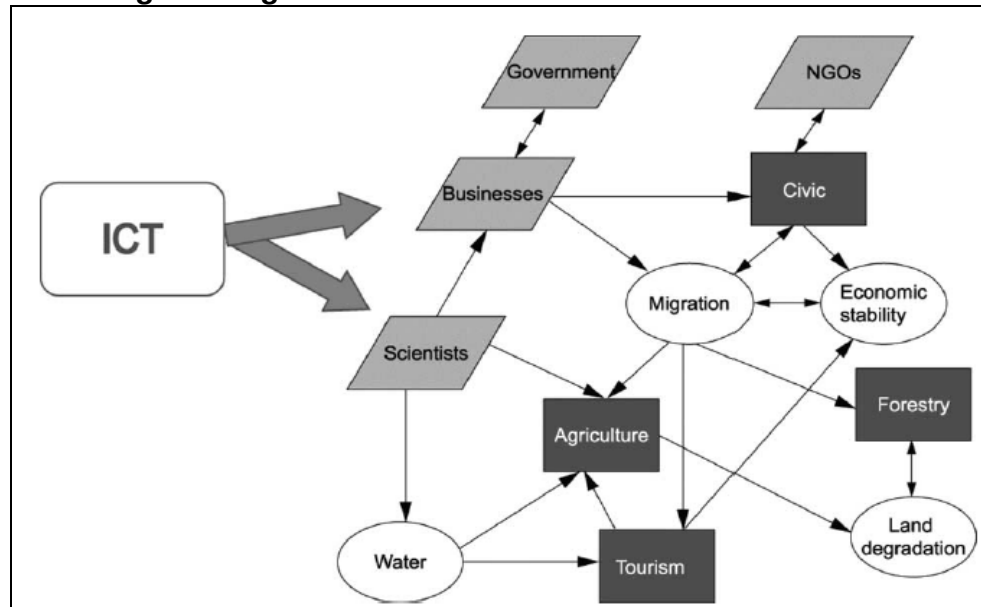
China adopted several economic reforms in the early 1990s which propelled its status to become one of the world’s largest economies today. However, its then leader, Deng Xiao Ping, was getting frail and experts were most concerned about the transfer of power after his death. This is a similar situation in DPRK where Kim Jong-il has been reported to be sick and have undergone operations in 2008. In the event of the death of Kim Jong-il, a power struggle would ensure even though a successor has been identified. Randall and Telesio (1995) conducted interviews with 70 leading experts on China from business, government, research institutes and academia – both in the USA and China. They constructed five scenarios broadly depicting China into the year 2010 (15-year scenarios) under different political and economic climates. Out of the five scenarios – ‘Muddling Through’, ‘Asian Power’, ‘Fragmentation’, ‘Shutting Doors’ and ‘Global Powerhouse’, the last scenario has become a reality in which China has become an economic power in the world.

Since proclaiming independence in 1991, Ukraine, one of the former Soviet states, faced a tumultuous transition. Industrial production declined by 75 per cent after the lost of steady production demand before 1991. According to Van Zon (2002), Ukraine is a blocked society facing market, hierarchy and network

failure. At present, DPRK is also facing total failure of the economic system with deep-rooted issues such as dilapidated infrastructure and lack of market planning. It is difficult to predict if DPRK would suffer the same fate as Ukraine. Von Zon (2002) used three countries – Mexico, Pakistan and Belarus to help him develop three alternative scenarios for Ukraine. His purpose is to extract critical elements in their developmental paths which might aid Ukraine.

On a supra-national level, scenarios have been developed for a sustainable Europe (Rotmans et al. 2000 and Kok et al. 2006). Both studies adopted the Integrated Assessment research paradigm comprising of selected themes, storylines and sectors using the Factor-Actor-Sector (FAS) framework. Factors referred to employment and consumption; Actors referred to governmental bodies, business companies, NGOs and Sectors referred to energy, transport and infrastructure. Rotman et al.'s (2000) study developed scenarios for Europe up to 2020 and 2050 (20 and 50 years). Kok et al.'s (2006) study adopted two scenarios from the earlier work by Rotman et al. (2000) – 'Big is Beautiful' and 'Knowledge is King (Figure 4.1)', and added another scenario 'Convulsive Change' to develop story lines up to 2030 (25 years). In the event of a reunification between DPRK and ROK, the dynamics in Northeast Asia would be transformed entirely. The interests of different actors (China, Japan, Russia and USA) need to be taken into account when constructing the unification scenario.

**Figure 4.1: Connections between Factors, Actors and Sectors in Knowledge is King**



Source: Kok et al. (2006, 273)

#### 4.1.3 Peace Scenarios

Scenarios have been constructed for countries which are facing political instability. These countries have to deal with internal strife (South Africa) or long-drawn conflicts with its neighbours or within a region (Pakistan and India, and the Middle East). These scenarios are applicable to DPRK as it is still technically at war with ROK. At the same time, DPRK is also facing political instability due to the issue of succession and the power of the military over technocrats.

South Africa is a country which has suffered from many years of apartheid. In 1990, the then-government started negotiations to end apartheid, culminating in the 1994 elections which were won by a Nelson Mandela-led African National Congress. In between, Esterhuyse (1992) researched on the problems, priorities and prospects facing South Africa over the next 5-10 years. His research developed one scenario 'Changing Gears' which focused on political

stability and social disintegration. Galer (2004) reported several studies conducted by different organisations from the early 1980s to 1990s resulting in various scenarios describing the different feasible futures for South Africa. Galer (2004) wanted to ascertain the value of those studies to changes in South Africa and if they could be replicated to other conflict situations. He found positive correlation in both questions. Scenario methodology can be applied to help countries dealing with changes, in this instance, DPRK.

India and Pakistan have been hostile neighbours for years in South Asia. Scenarios developed for both countries have been constructed with main focus on their neighbours. Similarly with DPRK and ROK, scenarios developed for the Korean Peninsula have to take into account the past hostility between both countries. Inayatullah (1992) developed five scenarios for Pakistan using literature reviews and interviews. In one of the scenarios, the author likened the country to that of DPRK's social structure and large military. In another scenario, the author looked at the issue of national sovereignty being threatened from India. Similarly, the sovereignty of DPRK will be under threat from external forces if it continues with its hostile actions. Waslekar and Bhatt (2004) painted four scenarios of India in response to the geopolitical developments in India's neighbouring countries and India's response to them, to determine the country's strategic options for the next 25 years. The authors identified a set of drivers which will influence India's strategic future, incorporating them into each scenario.

The Middle East has been engulfed with the ongoing conflict between Israel and the Palestine. Glenn and Gordon (2005) used literature reviews, interviews with experts in the field and a Delphi-study to create three normative, backcasted

scenarios of peace in the region. Their study identified seven conditions in each scenario which are precursor for peace to take place in the Middle East. Some of techniques might be appropriate when developing scenarios for DPRK especially when data is often lacking.

#### **4.1.4 Internal Instability Scenarios**

This section looks at two countries facing internal instability – Thailand and Bolivia. Thailand has been facing internal instability since its ex-premier, Thaksin Shinawatra, was forced to quit his post after several corruption cases. Several governments have come and gone without any effect of stabilising the situation in the country. One of the five scenarios developed included the possibility of a military coup due to ongoing violence between pro- and anti-government supporters (Emerging Markets Monitor, 2008). Bolivia is another country facing internal problems. Political Risk Services (2005) produced three regime scenarios for the country on an 18-month and five-year forecast with probabilities attached to each scenario. However, the report did not explain how they derived the probabilities to show different scenarios.

These examples are relevant to DPRK as it is also facing a certain degree of instability due to the power struggle of the military which might result in a coup or citizens facing poverty and lacking support from the government might decide to try and overthrow the government.

#### **4.1.5 Economic Change Scenarios**

Scenarios can be applied in planning for economic futures of countries at national and supra-national level. Diouf (1994) developed two scenarios for 25

years (from 1995-2020) to achieve economic integration for the African continent – status quo scenario based on both pessimistic and optimistic assumptions; and a scenario of effective integration bearing positive transformations. However, there was no mention on his methodology in deriving these scenarios. Next, Ghosh and Aker (2006) used qualitative methods in the form of expert interviews and symposium to analyse the economic future of North Cyprus. They recognised the impact of major players (E.g. Russia, Turkey, the USA, and the EU) on the country and four scenarios were developed. Likewise for DPRK, it is important to recognise the role of different actors and their impact on DPRK. China, ROK and the USA are major actors while Russia and Japan can be considered as less influential.

#### **4.2 Use of Scenario Approach in Transport Planning**

Transport planning is often concerned with the medium and long term future which is often characterised by high levels of uncertainties including the lack of knowledge on the social and economic policies which transport planning have to align with. Quantitative forecasting models are frequently of little help, because of their reliance on extrapolation of existing trends to picture their future (Pearman, 1988). Since 1970s, scenarios have been used an alternative to quantitative forecasting models to aid policy makers in long term transport planning. The earliest examples can be found on a regional level in a study by the SRI for the US Department of Transport (1976) and the Chicago Area Transport Study (Schofer and Stopher, 1979). This section will focus on transport scenario planning on various levels – regional, national and supra-national, and the methods used in developing these scenarios to derive the most suitable method(s) when developing scenarios for DPRK transport futures.

Most of these examples are found in the USA and Europe, with isolated cases from Australia, Israel, the UK and Sudan.

#### **4.2.1 Regional Level Planning**

This section looks at scenario planning for transport at a regional level. As mentioned earlier, the Stanford and Chicago study were the beginning of scenario planning examples in transportation. In the 1980s, several projects were commissioned by various metropolitan councils to “bring a new perspective to long-range transportation planning, particularly in relation to varying future conditions” (Mordecai, 1984 and Rutherford and Lattemann, 1988). Since then, according to Zegras et al. (2004), few scenario-planning efforts for metropolitan transportation planning or general regional planning appeared in the literature.

Zegras et al. (2004) identified a study which incorporated the scenario-planning exercise for the Mendoza Province in Argentina and applied it to the Houston Metropolitan transport planning. They used two different approaches – inductive and deductive when applying it to the Houston case. According to Van der Heijden (1996), the inductive approach “builds step by step on the data available and allows the structure of scenarios to emerge by itself”, while in the deductive approach, the overall framework is started with, “after which pieces of data are fitted into it”. Zegras et al. (2004) identified eight steps in the Mendoza study and developed a framework for the Houston case. They began by defining the objectives of prioritising a transport strategy in metropolitan Houston over the 20-25 years. Next, they identified the key local factors (e.g. shifts in environmental attitudes/politics and federal/state investments/control)

and the key driving forces that impact the key local factors (e.g. state of economy, technology and environment). In Step four, they developed potential combination of driving forces using two binary possibilities: good or bad (e.g. rapid economic growth or stagnation). From there, using their initial deductive scenario themes, they ‘flesh out’ three scenario stories, after which they assessed each scenario and options before developing a composite matrix by aggregating the individual multi-criteria analysis output. It is possible to consider the use of deductive and inductive approaches when developing scenarios for North Korea due to the lack of meaningful data.

Inayatullah (2003) applied scenario-planning approach to develop transport policy in South-East Queensland, Australia. Three futures methods were used in this research to communicate the alternative futures of transport: (1) futures triangle; (2) scenarios and (3) causal-layered analysis. Using the futures triangle – pull, push and weight of the future, four plausible futures were created. To understand the scenarios, four level of analysis was proposed. At the litany level, it includes basic trends of population growth and pollution levels. At the systems level (social, political and technological level), policies are constructed based on the issues at the base level. The next level of analysis, the worldview considers the views of different actors in the transportation futures – automobile industry, government authorities and citizens. At the last level, myth-metaphor is “the unconscious dimension to why we do what we do, what we don’t know we don’t know”. Applying it to the DPRK case, transport data records are not readily available and very often are not recorded. As with Zegras et al. (2004), it is important to identify the various actors and factors which determine the different transport scenarios. It is possible to develop different scenarios at a



regional level for DPRK, identifying the key cities along with their industrial development.

A two-round Delphi expert-based survey was adopted by Shiftan et al. (2003) when constructing two scenarios (expected and desired) for the future sustainable development of the Tel-Aviv Metropolitan Area in Israel. Similarly with previous studies, five individual factors that, according to the authors, will determine whether progress in transportation will be sustainable were identified. This study used a backcasting approach (2003, 328) which “*helps to identify future goals and conflicting interests, investigate change in existing functional relations and enables value judgement*”. The justification using experts lies in the fact that they possess the best knowledge in their fields of interests. In the case of NK, the pool of experts is not sufficiently large enough to use a Delphi-study to develop transport scenarios. The Delphi technique has been criticised in early literature (Hill and Fowles, 1975). One criticism of Delphi method is the relatively narrow range of future images produced. On the contrary, it is useful to produce three or more images of the future of transport system in DPRK to provide more options to policy makers to aid in planning. However, the use of Delphi method might be restricted due to the lack of experts on DPRK transport.

#### **4.2.2 National Level Planning**

This section reviews two studies on countries – Sudan and the UK, which has applied scenario planning at a national level. Saaty (1977) in his application to the Sudan case first constructed econometrical models projecting it to 1985 – 10 years ahead. Anticipatory scenario construction was used to develop four scenarios, taking into account all major economic, political, social and transport

parameters. Anticipatory scenarios start with the future and work backwards to the present to discover what alternatives and actions are necessary to attain these futures. A hierarchical prioritisation model using pairwise comparison of the four scenarios helped develop a composite scenario in which one scenario emerged with the strongest weighting with some elements of two other scenarios. One criticism is the use of information derived from econometric study and estimations of production and consumption patterns which might give rise to errors. It will be important to take into account the political, economic, social and transport factors when developing transport scenarios for DPRK. However, the applicability of econometric models to DPRK is minimal given the lack of historical data.

Potter and Roy (2000) produced four scenarios (cost driven, technology driven, quality driven and environment driven) for the future of UK rail transport. The projected scenarios were developed until 2010. One of the purposes of their work was to assess the usefulness of the scenarios five years on since they were first written in 1995. The method used in their research was through a conference where main themes were developed for the science and technology implication for each scenario. They concluded that the scenario planning approach as a futures exploration technique “has proved to be a robust, enlightening, and useful approach”.

#### **4.2.3 Supra-national Level Planning**

At a supra-national level, many studies have been commissioned by the EU to develop scenarios reflecting transport mobility and sustainable development (Banister et al. 2000; European Commission DG Energy and Transport, 2003;

Foresight for Transport, 2004; May, 2005; Nijkamp et al. 1997a, 1997b and 1998; and Stead and Banister, 2003). In planning for DPRK transport, transport flows have to take into account the potential of reunification between DPRK and ROK or the interests of various actors in DPRK's transport sector (China, Japan and Russia).

Banister et al. (2000) and Stead and Banister (2003) adopted both qualitative scenario building methods and backcasting approach to develop transport scenarios up to the year 2020 in line with the EU's vision for sustainable transport mobility. Banister et al. (2000) first set clear environmental, regional development and efficiency targets, within which strategies are developed. They also considered an external element of either greater co-operation or fragmentation in developing three images of the future. The conclusion of their study leads on to the work conducted by Stead and Banister (2003), which includes an eight-stage scenario building process. The result is the development of five policy packages which was validated and assessed using workshops, interviews and/or questionnaires to explore the levels of acceptability of each policy package. Using a backcasting approach to develop transport scenarios for DPRK is extremely difficult due to the volatile political situation in the Korean Peninsula along with the question of economic funding over transport projects to make a backcasting approach viable in the case of DPRK transport images.

Nijkamp et al. (1997a, 1998a and 1998b) used a qualitative multi-criteria approach known as the "*Spider model*" (see Figure 4.7) to construct expert-based scenarios for transport policies in Europe up to the year 2030. In their research, they develop two scenarios – expected and desired based survey

questionnaires with Dutch transportation experts and researchers with various backgrounds. In their analysis, they classified the driving forces which are critical for the future of transport systems, into four groups – spatial, institutional, economic and social/psychological aspects. The scenarios developed are a response to forces and developments in the four groups. One of the advantages mentioned is that *“individual assessment criteria do not have to be measured in a single quantitative unit; they may be qualitative in nature (e.g. rank orders)”*. According to Nijkamp et al. (1998), the inner points close to the origin are more associated with non-intervention strategies whereas the outer points reflect policy interventions. There are a total of eight axes which make up the Spider Model. Using the combination of the rank scores on all the eight points, expected and desired scenarios were constructed. One of the problems of this model is that only two scenarios were constructed and only four major factors represented the Spider model. In DPRK’s case, there might be more than four factors (e.g. government, economic, legal, spatial, social, organisational, managerial, infrastructure) which will influence the future of transport system. As a result, the applicability of the spider model might not be appropriate.

#### **4.2.4 International Level Planning**

Through various literature search transport scenarios at an international level has been less researched due to the complexities of international transport in an age of globalisation. Ubbels et al. (2003) considered the development of international transport sector for both passenger and freight transport until 2020. Each of the images of the future transportation market was constructed at three different levels (global, European and Dutch) based on four globalisation scenarios (Growth, Core-Growth, Peripheral Growth and Sustainable Growth).

Indicators expressed as positive ( + ), negative ( - ) or neutral ( 0 ) formed the basis of scenario description and showed the expected impacts of transport volumes. Using the WorldScan Model, quantitative transportation estimates were calculated to derive the expected volume changes for each transport mode in 2020. Due to lack of transport data, it is not plausible to obtain estimates of DPRK passenger and freight transport flows. Hence, Ubbels et al. (2003) is not considered appropriate in this research.

### 4.3 Scenarios of DPRK

The purpose of analysing the 19 publications was to identify common scenario themes in the literature and internal and external developments which affect DPRK as well as to identify the types of methods used in deriving the scenarios. Table 4.1 presents a summary of the scenarios, with a majority of the literature focusing on two main issues – politics and economics.

**Table 4.1: Summary of Scenarios of DPRK**

<b>Author</b>	<b>Scenarios</b>
Van Hippel, D.F. and Hayes, P. (1997)	1. Recovery scenario 2. Decline scenario
Maxwell, D. (1997)	1. Reunification with ROK 2. Bloodless coup 3. Complete collapse and disintegration 4. Military coup
Pollack, J. and Lee, C.M. (1999)	1. Integration and peaceful unification 2. Collapse and absorption 3. Unification through conflict 4. Disequilibrium and external intervention
Inoguchi, T. (2001)	1. Westphalian scenario (regime survival) 2. Philadelphian scenario (peaceful reunification) 3. Anti-utopian scenario (collapse)
Nautilus Institute (2002)	1. 'Gridlock' 2. 'Great Leader 3' 3. 'Phoenix' 4. 'Mujige – Rainbow'
Noland, M. (2002)	1. Successful reform (regime survival) 2. Muddling through (status quo) 3. Elite conflict

	4. Mass mobilisation (citizen uprising)
Nautilus Institute (2003)	1. 'Green Flash' 2. 'Boom Boom' 3. 'Embrace Tiger Retreat to Mountain' 4. 'Eagle Stands Alone'
Park, H.J. (2003)	1. Confrontation between DPRK and US 2. Beginning of negotiation 3. Adoption and implementation of agendas for dismantling 4. Complete dismantlement and end of negotiations
Aslund, A. (2004)	Used example of Albania to describe how DPRK may crumble.
Lim, W.H. (2004)	1. 'Outward-Oriented Developmental Dictatorship' 2. 'Half Full, Half Empty' 3. 'Arduous March' 4. 'Neither a Rogue nor a Tiger'
Moon, C.I. (2004)	1. Status quo 2. System modification 3. System collapse
Park, H.J. (2004)	Constructed matrix with assumption of three possible developments for nuclear issue and three possible alterations of North Korea's state capability
Noland, M. (2004)	1. Cooperative engagement 2. Neoconservatives dream 3. International embargo
Jo, D.H. (2006)	1. South Korea-led scenario 2. South Korea/China-led scenario 3. Related countries jointly-led scenario
Kim, K. (2006)	1. 'Rogue State' 2. 'Flood-Famine' 3. 'Eco-Tourism' 4. 'Industrial Estate'
Scobell, A. (2007)	1. Soft landing – reform and opening 2. Crash landing – collapse by any other name 3. Suspended animation – stasis
Lankov, A. (2008)	1. Market reform – the Chinese way 2. Regime collapse – Unification by co-option into South Korea 3. Regime collapse – establishment of Pro-Chinese Regime 4. Military revolt – Long term chaos
Business Monitor (2008)	1. Muddling through 2. Reformist takeover and rapid reform 3. Sudden collapse 4. Internal civil war – military coup 5. US/South Korea invasion
Suh, J.J. (2008)	Advocates status quo scenario of regime sustainability
Stares and Wit (2009)	1. Managed succession 2. Contested succession 3. Failed succession

Source: Author

Focusing on the issue of DPRK's energy problems, Van Hippel and Hayes (1997) used energy figures available in 1990 as a baseline to extrapolate figures for two scenarios: recovery and decline for two time period – 2000 and 2005. Under the recovery scenario, the assumption is that with a combination of external aid and internal transition, DPRK's economy will surpass 1990 performance in most sectors by 2005. On the contrary, its economy will continue to decline through the year 2000 and recover slightly through the year 2005 if internal transition is not carried out.

Maxwell (1997), writing for the USA military used a modified 'backward planning' working backward from fifteen to twenty years focusing on the long term regional interests to near term actions in the event of DPRK's catastrophic collapse. Four possible scenarios were proposed. In the first scenario, Kim Jong-il approaches ROK and proposes reunification as his power base weakens. The next scenario contemplates a bloodless coup in which the military takes over and installs a moderate regime embarking on economic and political reform. This scenario looks improbable due to the interests on the military in maintaining a closure to the rest of the world. The third scenario signals a complete collapse and disintegration of the national government. The ruling elite would seek asylum in another country and total chaos would besiege the country with migration across to China and ROK. This is the scenario which both countries will fight hard to avoid as it will bring internal destabilisation. In the last scenario, multiple factions exist with infighting occurring as each of them struggles for power and one of them conducts a coup to oust the present regime.

Pollack and Lee (1999) concluded that unification was inevitable as DPRK could not continue to ensure regime survival. However, this has been proved wrong numerous times as the regime has shown tremendous resilience in maintaining status quo. With no mention of the methodology used, they examined alternative scenarios leading to Korean unification, dividing into three time periods up to the year 2000, 2005 and 2010. Using four considerations – major characteristics; potential indicators; preferred and variant paths and strategic implications, they focused on:

1. Unification through peaceful integration and negotiation;
2. Unification through absorption following a collapse;
3. Unification through conflict or war; and
4. Sustained equilibrium and potential external intervention.

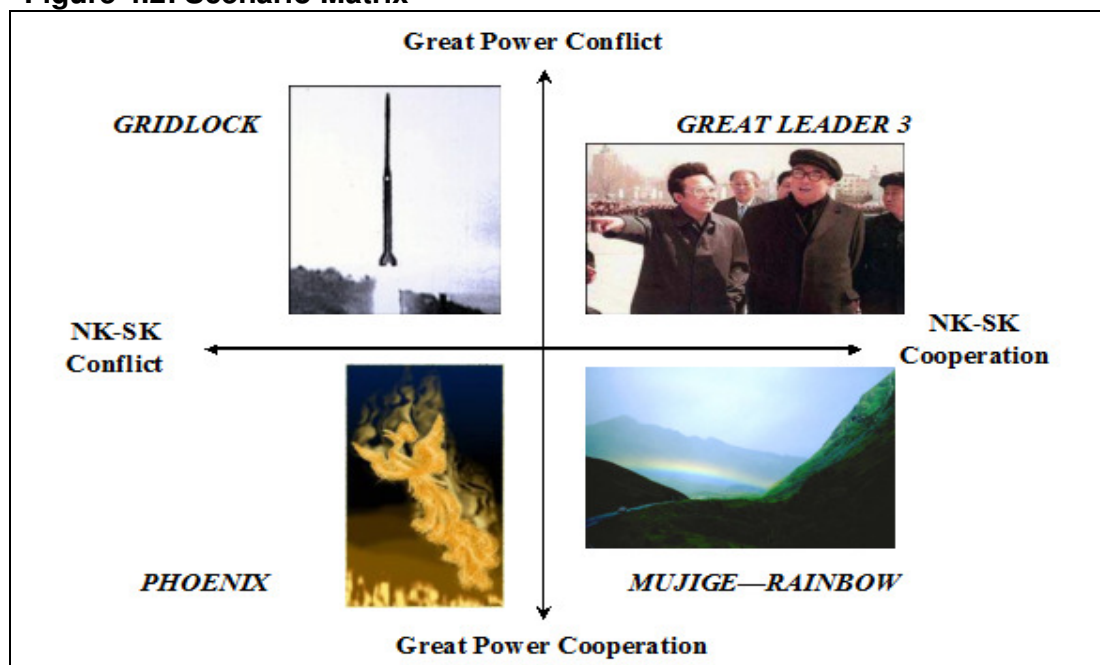
Inoguchi (2001) speculated on the situation surrounding the Korean Peninsula up to the year 2015 using three viewpoints – state centric; liberal and post-colonial. In the state centric viewpoint – the Westphalian scenario likens to a status quo position, DPRK regime remains strong and it will continue its unification policy. ROK will continue to engage DPRK economically with little governmental intervention. The next viewpoint - Philadelphian scenario displays characteristics of a peaceful unification. This scenario purports elements of confederalism, economic interdependence and democratic peace. DPRK's unification policy has long been based on a confederate peninsula but not supported by ROK. Economic interdependence has progressed in several steps – Mt. Kumgang tourist zone, Kaesong Industrial Complex and other infrastructure projects. The last viewpoint – Anti-Utopian scenario depicts a complete collapse in DPRK with the need for international intervention.



The Nautilus Institute, a think-tank based in the USA, focused on security and sustainability issues involving the USA and other East Asian countries with main focus on the Korean Peninsula. Over the years (2002 and 2003), they have conducted scenario workshops on several occasions, bringing together experts to explore uncertainties regarding DPRK including solving the nuclear crisis issue and to develop scenarios to help the United States develop strategies to cope with DPRK. In 2002, a workshop on 'Future Scenarios for USA-DPRK Relations' was conducted to answer the question "What will DPRK's relations with the USA look like in 2012?". Using two uncertainties - the relationship between DPRK and ROK and geopolitics development surrounding the Korean Peninsula, four scenarios were developed (Figure 4.2). In the '*Gridlock*' scenario, DPRK aligns itself with China while USA-ROK alliance strengthens. As satellite phones continue to enter through China and ROK, local citizens are able to communicate with the outside world. DPRK, with nuclear weapons, begins to collapse. Under the '*Great Leader 3*' scenario, a new leadership emerges after Kim Jong-il and status quo scenario continues to endure while ROK will invest in large scale projects in the North with hope of improved relations. Under the '*Phoenix*' scenario, DPRK regimes collapse in rebellion and famine savages the country. The UN and multilateral forces work together to rebuild a peaceful new reunified Korea. The last scenario – '*Mujige – Rainbow*' supports economic reform and diplomatic normalisation in return for DPRK's abandonment of any nuclear ambitions. Loans will be provided to DPRK to rebuild the country with barriers between two Koreas falling. In 2003, the Nautilus Institute gathered another group of experts to contemplate about the nuclear crisis, with a lead up to the Presidential Election in the USA in

November 2004. Four scenarios, normative and generative in nature, were developed with objectives based on peaceful outcomes. In the first scenario, '*Green Flash*', DPRK admits possessing nuclear weapons but conflict is avoided. The next scenario, '*Boom Boom*' depicts a violent world where DPRK establishes its nuclear capacity regardless of consequences. In the third scenario, '*The Eagle Stands Alone*', concessions by the USA to DPRK proves futile in avoiding confrontation. In the last scenario, '*Embrace Tiger, Retreat to Mountain*', DPRK stops pursuing nuclear weapons and opts for economic development and conflict is avoided.

**Figure 4.2: Scenario Matrix**



Source: Nautilus Institute (2002, 10)

Noland's (2002) work considered the internal and external developments that will shape DPRK in the near future. In addition, he suggested three wildcards – death of Kim Jong-il, international trade shocks and weather, which might affect those developments. Four outcomes were developed as a result. The most successful outcome results in economic reforms following the China and

Vietnam models. The next scenario sees DPRK maintaining a status quo scenario with less internal changes. The third outcome results in an intra-elite coup in which new leadership assumes control. The final possibility results in complete collapse of the regime leading to mass mobilisation.

Park (2003) proposed a four-step scenario for the rebuilding of the DPRK economy beginning with confrontation between DPRK and the USA and ending with complete dismantlement. Confrontation and threats has been DPRK's main strategy in engaging the USA. Aslund (2004) used the example of Albania as a scenario of how DPRK may crumble. Lim (2004) examines the economic reforms undertaken by DPRK and alternative economic futures using a decision forecasting model and scenario planning framework. Four scenarios were developed as a result. In the '*Outward-Oriented Developmental Dictatorship*' scenario, DPRK undertakes further economic reforms it implemented in July 2002 and opens up to foreign investments. In the '*Neither a Rogue nor a Tiger*' scenario, DPRK pursues limited reform while at the same time normalises relations with the USA and Japan. The third scenario, '*Half Full Half Empty*', depicts DPRK pursuing major reforms but with security issues resolved, external economic assistance is limited. In the last scenario, '*Arduous March*', the worst possible circumstances occur with DPRK pursuing limited economic reforms and maintaining defiant stance on nuclear weapons which limits the amount of economic assistance available.

Moon (2004) suggested that DPRK will maintain a status quo in the near future. However, continuation of the status quo cannot assure DPRK's long term survival hence it needs to modify the system towards opening and reform. The third scenario focuses on system collapse as a result of blind maintenance of

the status quo or failure to cope with transitional instability arising from system modification. Park (2004) constructed a matrix to illustrate nine different scenarios of DPRK's internal and external developments with the assumptions of three possible developments for the nuclear issue – peaceful resolution, stalemate and sanctions, and three possible alterations of DPRK's state capability, strong, medium and weak. Noland (2004) used statistics from the BOK to highlight its poverty and generate a model showing the probability of regime change in DPRK. In the 'cooperative engagement' scenario, DPRK opens up its economy and normalises its relations with other countries. The likelihood of this scenario was one per cent. In the 'neoconservatives dream', the global community puts a squeeze on the present regime and aid is cut off, something similar to the current situation: its probability was 14 percent. In the final scenario of 'international embargo', DPRK's relations with the rest of the world deteriorate precipitously with all international trade cut off: although its probability was 40 per cent, Noland suggested it might be politically unrealistic.

Jo (2006) suggested three time periods: (i) 2006-2012 (ii) 2013–2020 and (iii) 2021 and beyond, classifying the scenarios into (a) ROK-led scenario which will see a delay in nuclear issues and limited opening by DPRK (b) ROK and China co-led scenarios which will see active involvement by China and lastly (c) a related countries jointly-led scenario for the resolution of the nuclear issue through six-party talks. China has continued to engage in talks with DPRK urging the country to return to the table for further talks on the nuclear crisis.

Kim (2006) four scenarios that evaluated the desirability of railway and infrastructure project integration in Northeast Asia. Different driving forces, strategic concerns, key actors, likelihood, costs and wildcard events helped

developed four scenarios - '*Rogue State*', '*Flood Famine*', '*Eco-Tourism*' and '*Industrial Estate*'. Under the '*Rogue State*' scenario, DPRK continues to maintain its 'Juche' policy and any railway projects will enable DPRK to move its military assets quicker and also see an increase in illegal activities such as counterfeiting or drugs smuggling. In the '*Flood and Famine*' scenario, DPRK faces wide spread droughts which plagued the country in the late 1990s. Investment in rail projects will help with the delivery of humanitarian aid; provide job creation and upgrading of infrastructure. The '*Eco-Tourism*' involves building on the success of Mt. Kumgang project and upgrading of the two railway lines would enable more tourists to visit other destinations, including connection to the TSR line. In the '*Industrial Estate*' scenario, special economic zones are created in Rajin and Sinuiju with high level of international investment and expansion of industries in DPRK. The Gyeongui Line would benefit the Pyongyang-Sinuiju corridor with connections to Trans-China railway while the Gyeongwon Line will serve Rajin-Sonbong and the Tumen River development zones.

Scobell (2007) considers three scenarios for DPRK and their implications for the USA-China relations for a period of 10 to 15 years. In the soft landing or 'muddling through' scenario, DPRK is expected to adopt partial or ongoing economic reforms which is most favoured by China. However, Scobell considers this as an unlikely scenario due to Kim Jong-il's fear of how the reforms will loosen his grip on his rule. In the 'suspended animation: stasis' outcome, which is essentially a status quo scenario, DPRK is either unwilling or unable to change. This outcome is very likely as DPRK does not have to make tough choices on reforms. The above two scenarios is expected to last for at

least five to ten years. In the last scenario – ‘crash landing: collapse by any other name’, it is predicted that collapse could be quiet and trouble-free or noisy and chaotic, resulting from internal rebellion.

Lankov's (2008) scenarios follow closely to previous scenarios mentioned. In the first scenario, DPRK follows the China/Vietnam model with focus on agriculture and small-medium sized enterprises. However, Lankov thinks that this scenario is not feasible due to the inflow of information from the outside world which will slowly weaken the present regime. The second and third scenario envisages a DPRK collapse with ROK and China taking over the country in the former and latter scenarios respectively. The last scenario gives rise to a revolt by various factions which neither China nor ROK wants to get involved in. Similarly, Business Monitor (2008) believes that DPRK cannot maintain status quo scenarios forever and constructed five scenarios for change:

1. Muddling through – slow economic reform with ongoing trade with and investment from China and ROK;
2. Reformist takeover and rapid reform - Kim Jong-il's successor embarks on rapid political and economic reforms which might lead to either adaptation of market reforms or a collapse in the successor regime;
3. Sudden collapse – either China or ROK could take over the country;
4. Civil war within DPRK; and
5. USA/SK invasion.

Suh (2008) analysed the regime sustainability inside DPRK and concluded that the status quo scenario is being maintained due to the creation of new regime adaptability. The second society, where people are focused on making money,

continues to support the failed first society – official economy. He concludes that the regime will officially recognise the second society rather than risking a collapse by sudden revolt. Stares and Wit (2009) focused on the succession issues and how different scenarios would pose different problems for policymakers in the USA. Under the ‘managed succession’ scenario, Kim Jong-il designates a successor from the lineage or the emergence of a collective leadership from the military. It is expected that transfer of power would be seamless and the new regime would receive support from the military. In the ‘contested succession’ lies the existence of various factions within the regime. Within Kim Jong-il’s lineage, his three sons together with other relatives are fighting to be the rightful heir. Other options include a coup within the military. In the last scenario – ‘failed succession’ produces no clear leader, creating chaos which might lead to a civil war internally. Similarly, China or ROK might take the lead to restore peace in the country.

#### **4.4 Summary**

This chapter examined the use of scenario planning to aid countries in future planning. Analysis focused on disintegration and reunification scenarios; national and supra-national development scenarios; peace scenarios; internal stability and economic change scenarios. Next, the use of scenarios in transport planning on a regional, national, supra-national and international level was discussed. A variety of methods were used to develop the scenarios and the time lines range from 5-25 years. Lastly, analysis of scenarios constructed for DPRK showed that a majority of the studies did not specify any techniques used except for the expert workshops conducted by the Nautilus Institute. Several common scenarios emerged from the literature: Status quo/muddling through;

Regime collapse through military coup; complete collapse of system; unification through peaceful means or conflict.

The next chapter presents the research methodology, explaining the research philosophy; justification for the choice of research methods; the data collection and analysis process and ethical considerations applied to this research.



## **CHAPTER 5 – METHODOLOGY**

This chapter describes the research methodology which forms the basis of the thesis. It gives the rationale for choose the research philosophy and methodology and describes the data collection and analysis process before concluding with ethical considerations. Additionally, Appendix III provides an introduction to social research in general (addressing different research philosophies, research strategies, triangulation/mixed methods approaches, data collection methods, time horizons, and important criteria in business research) in order to put the chosen research strategy and selected research methods for this thesis into context.

### **5.1 Research Strategy for this Thesis**

It is important for researchers to select the most appropriate strategy for their research. The right selection is essential for the success of the thesis and depends on various factors – nature of research and the research questions. Saunders et al. (2003) furthered strengthened the view that no one approach is better than another, rather the approach would depend on the research question (s) that the researcher is seeking to answer. In addition to that, other practical considerations such as money, time or access to data play an important role as well. Some research methods might be the key to useful and worthy data but are inappropriate because they are time consuming and/or prove to be too expensive. In the case of this research, access to data and limitation of financial resources/time were crucial factors in determining the choice of research methods. The following sub-sections will first present the conceptual framework and research questions. Then it will describe the

research philosophy and methods selected for the purpose of this research and justify their selection.

### **5.1.1 Conceptual Framework and Research Questions**

Chapter 2 described DPRK's political economy and established that DPRK claims to practice self-sufficiency but in fact does earn hard currency either through setting up SEZs like Kaesong Industrial Complex or engaging in foreign trade with countries such as China, ROK, Russia etc.

Chapter 3 described the transport and logistics infrastructure in DPRK and concluded that there is a need to appraise and prepare a comprehensive transport and logistics roadmap for DPRK. Location factors were discussed to ascertain the potential factors determining the location decisions of enterprises in DPRK in the future.

Chapter 4 described the various methods and analytical tools for developing scenarios for DPRK which are crucial to providing insights into the future development of the country and its transport and logistics infrastructure in the next 20 years.

In light of the literature review, the proposed central research question is as follows:

“What are the implications of ROK small and medium enterprises’ (SMEs) and logistics companies’ location decisions on transport and logistics developments in DPRK?”

A conceptual model for the research is presented in Figure 5.1. The model does not seek to test or explain casual relationships. However, it does aim to generate factors that could influence the development of transport and logistics

developments in DPRK. These factors are developed through analysis of the literature and in-depth semi-structured face-to-face exploratory interviews conducted in the first phase and also drawn from (1) the PESTLIED model, which is used for assessing an organisation external environment (Harding, 1998), (2) MacCarthy and Atthirawong (2003)'s study into factors affecting international location decisions and (3) Roe's (2003) work into shipping policy making. These contexts provide a framework to analyse the possible strategies for transport and logistics development. They will be facilitated into the qualitative and quantitative research to answer the research objectives.

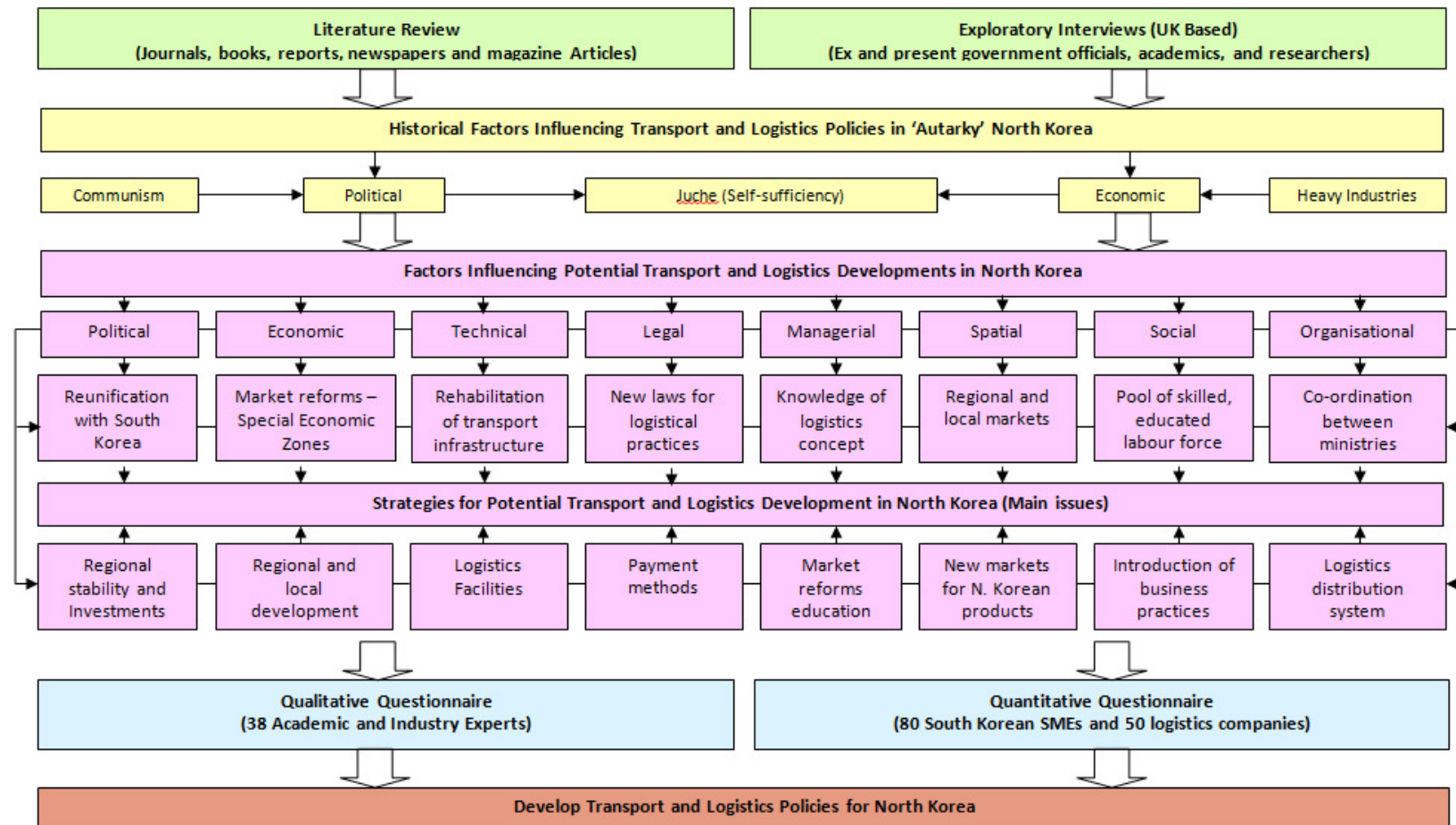
The model identified sub-elements which are critical to the development process. Political stability between both Koreas and in the region is crucial for DPRK to induce much needed foreign capital to rehabilitate its dilapidated transport modes (Babson, 2001; Lee, 2004 and Lim, 1997). Currently, DPRK is not a member of international financial institutions, which prevents them from securing loans. The reconnection of the TKR is the first step in reconstruction (Oh, 2001 and Tsuji, 2005). DPRK has to embrace new modern technologies (Lee, 2004 and Oh, 2001). Economic reforms in the form of SEZs will enhance regional and local development with implications on transport linkages and accessibility (Lim, 1997). Transport cost factors will also be an important determinant (Babson, 2001; Ahn, 2002 and Jung et al., 2005). New laws are needed for international payment methods (Dong, 2001). Managers need to be educated in transport planning policies and logistics concepts (Lee 2004 and Oh, 2005). The need to find new markets for DPRK products, regional and/or local, plays an important role in transport development (Hoon, 2001; Kim, 2003 and Park, 2004). A pool of skilled, educated workforce is required for

understanding operating new technologies (Babson, 2001; Jung et al., 2003 and Lee, 2005). Organisational factors centre on logistics linkages and accessibility as well as the logistics distribution system (Dong, 2001).

In view of the conceptual framework, the following research questions were developed and the research philosophy and data collection process will be guided by the following questions:

1. What are the impacts of the different DPRK scenarios on the transport and logistics developments in DPRK?
2. Where are the locations in DPRK for future developments as SEZs?
3. What are the transport infrastructure strategies and priorities for DPRK?
4. What are the managerial skills that DPRK managers should acquire?
5. Where are the main markets for DPRK -made products?
6. What are the different industries which DPRK can focus in?
7. What are the factors which influence the location choices of potential ROK investors?
8. What are the types of logistics services/concepts to be introduced in DPRK?

**Figure 5.1: Conceptual Framework**



### 5.1.2 Choice of Research Methods

Appendix III provided an overview of the research process elements. This subsection presents the rationale for the research choices and methods for the purpose of this study.

- *Research philosophy:* As mentioned earlier, social and business research is not constrained by a choice between two extremes as indicated by the two paradigms of positivism and interpretivism. From the literature review, it is apparent that research into DPRK has leaned towards interpretivism involving study into the changes that are shaping the reclusive state. At the same time, the author believes that developments in DPRK are positivistic in nature due to the involvement of foreign companies which will impact on transport and logistics policies. To embrace both trends, the author has taken a relativist view of ontology and adopted a pragmatic research epistemology as the research questions do not suggest that either a positivist or interpretivist philosophy in isolation is appropriate. Rather, a mixed methods strategy is deployed.
- *Research approach:* Sekaran (2003, 27) notes that 'answers to issues can be found either by the process of deduction or the process of induction, or by a combination of the two'. The researcher has chosen the combination approach in this thesis. Firstly, there is little existing literature on transport and logistics development in DPRK as well as investment decisions of ROK SMEs in DPRK. In addition, from the author's trips to DPRK, the lack of reliable data would pose hindrances. Therefore, an inductive approach in the initial stage to build up propositions and research questions would seem

more appropriate. Subsequently, a deductive approach was selected to explain the relationships between several themes in the scenarios and also to quantify the opinions and beliefs of the ROK SMEs.

- *Research strategies:* Social and business research offers a wide range of possible research strategies as discussed in Appendix III. The most appropriate strategy will help to generate satisfying answers to the research questions. Experiments, action research, ethnography and archival research were felt to be inappropriate in the first instance. Quantitative forecasting techniques were rejected on the basis of the lack of reliable quantitative historical data on DPRK due to its autarkic nature. Any data available should be subject to strict scrutiny since DPRK has not produced any meaningful data since the early 1980s. Case studies were not considered as they are time-consuming and inappropriate to this research as they only provide a narrow view. With this in mind a combination of research strategies, incorporating elements of grounded theory (i.e. exploratory study), survey and futures and scenario research were deployed to test the research questions.
- *Mixed methods choices:* Both mono-methods and multi-methods were rejected as they were considered too restrictive, only concentrating on either quantitative or qualitative world view. After careful consideration, a sequential equal status mixed methods design was felt most appropriate. It was conducted in three stages. The first stage was an exploratory stage using qualitative methods and analysis. The results of the analysis together with the literature review were incorporated in the second stage where both qualitative and quantitative research was conducted concurrently. The

results of the experts' interview were then used to develop scenarios for DPRK. The results of both ROK SMEs and logistics companies' surveys were used to answer the research objectives and questions.

- *Time horizons:* Given the nature of this research and the relatively short period of time to complete the doctoral thesis, it was decided that a cross-sectional study would be the most appropriate as part of the research works with larger sample population investigating ROK small and medium enterprises (SMEs).
- *Data collection methods:* Saunders et al. (2007, 130) encourage the 'evaluation of all possible data collection methods and to choose those most appropriate to the research questions(s) and objectives'. It was decided that this thesis would adopt the mixed methods approach involving a two-stage strategy. The first stage involves qualitative interviews in the form of exploratory conversations with experts together with analysis from literature reviews to develop the main research questions for second stage study. The next stage involves both in-depth qualitative interviews and quantitative surveys as the main data collection instruments.

The main rationale for selecting ***exploratory study*** was the belief that, in order to clarify and define the nature of the problem, it would be most appropriate to talk to the people with interest/involvement in DPRK. These include academics, present and past government and international officials and market researchers. This is in line with Oppenheim (1992), who identifies developing ideas and understands how people think and feel about the topics of concern to the research as the principal purpose of exploratory



interviews. Due to the lack of time and finance, only those in UK and China were identified in the initial stage. Another justification is the lack of sufficient data through the literature review to be able to gather constructs for any meaningful data collection and analysis. As a result of the interviews and in combination of the findings of the literature review, several underlying themes emerge which were used to generate research questions to be tested in the second stage.

Consequently, both ***in-depth qualitative electronic-mail interviews*** and two ***quantitative surveys*** using structure self-administered questionnaires, which were sent by post and e-mail, were selected in order to generate deeper understanding of the themes develop in the exploratory stage and to collect the type of data to answer the research questions generated. In-depth interviews were conducted on academic and industry experts while quantitative surveys were developed for both ROK SMEs and logistics companies.

The research methods selected for the purpose of this study reflect the nature of the research, as it investigates transport and logistics developments in DPRK from different perspectives.

## **5.2 Data Collection Methods**

This section describes the preparation and analytical methods of the initial exploratory interviews and second stage data collection process of the electronic-mail qualitative interviews and postal quantitative surveys.

### **5.2.1 Exploratory Study**

An exploratory study is a valuable means of finding out 'what is happening; to seek new insights; to ask questions and to assess phenomenon in a new light' (Robson, 2002, 59). It is conducted in the initial research stage to clarify and define the nature of the problem. There are three principal ways of conducting exploratory research – (a) a search of the literature (b) interviewing 'experts' in the subject and (c) conducting focus groups. This thesis used the first two ways to explore the initial research on DPRK. The last method was rejected due to the physical impossibility of gathering experts from different countries together to conduct focus groups. The whole process of exploratory study, which took place over a one year period, can be divided into two parts – literature review and interviews with experts.

#### **5.2.1.1 Pre-Interview Phase**

Literature search on DPRK included all aspects and topics in previous studies including books, journals, reports, newspapers and magazine articles covering a time frame from 1940s to 2008. The main purposes were to gain an in-depth understanding of current issues and to pick out the main themes, theories and methodologies surrounding research on DPRK in preparation for the next stage of semi-structured interviews with experts. The most common themes include politics (political leadership, weapons of mass destruction and reunification) and economics (financing, economic statistics) due to the state and nature of the country. Other themes include tourism, legal and transport.

The initial plan was to carry out interviews with experts who have previously worked on or who are presently engaged in DPRK affairs. Due to time and

financial constraints, it was decided that the majority of the interviews will be conducted in the UK. Later on, the author also had an opportunity to make a field trip to China to interview several experts. A list with potential interview candidates in the UK and China was produced in April 2006. Some candidates were included simply because of their position, for example past and previous government and international officials who have worked in DPRK. Others attracted attention as a result of their journal/book publications or having business dealings in DPRK. In May 2006, the first potential UK interviewees were contacted by electronic mail asking for an interview while interviewees in China were contacted in July 2006. Electronic mail is a popular tool to make initial contact with the other party and it is also a popular means of communication widely used by business organisations and government departments. The email (Appendix IV) contained a formal enquiry, a brief description of the research as well as an invitation to contact supervisors in order to cross-check on the validity of the enquiry. A total of five out of ten candidates responded positively to the interviews in UK while three out of six candidates in China did so likewise. The response was encouraging considering the nature of the research but during the course of the interviews, interviewees often mention that they were interested to know the outcome of this thesis. Those respondents represented the main groups interested in DPRK, ranging from governments, researchers, non-governmental organisations, business organisations and international bodies. Those who declined to be interviewed gave reasons such as lack of time or sensitivity of the topic. The UK interviews were carried out between May and July 2006 while the field trip to China took place in August 2006.

### **5.2.1.2 Interview Phase**

The interviews took the form of semi-structured one-to-one conversations and individual interview questions (tailored to each individual due to their expertise) which had been created in advance. Semi-structured interviews 'allow the discussion to lead into areas which may not have been considered prior to the interview but which may be potentially relevant to the study' (Goulding, 2002, 59). The interview questions were sent to the interviewees prior to the interviews in order to allow them to think and prepare the questions. It also helped to ensure that the interview flowed smoothly. In some instances, some questions were dropped in favour of more important questions and discussions which arose during the course of the interviews. Tape-recorders were used to supplement notes taken down. Easterby-Smith et al. (2008, 150) refer to the issue of the effects of using tape to record interviews. Their advice was to 'hand over the responsibility for switching the tape on and off to the interviewee, so that when he or she does not wish certain parts to be recorded, they can just switch off the machine'. No respondent objected to the recording or to being cited.

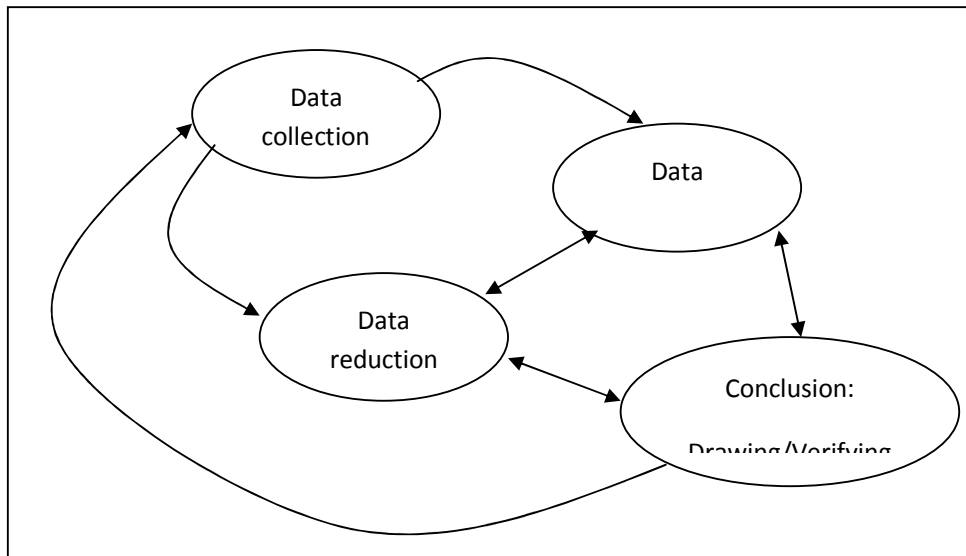
By August 2006, the exploratory phase of the study had been completed. A total of eight interviews were conducted. The composition of the interviews is as follows:

- Three interviews with academic and market researchers.
- Two interviews with past and present British government officials.
- Two interviews with business organisations with interests in DPRK.
- One interview with a UN official involved in food aid and developmental projects in DPRK.

### 5.2.1.3 Analysing Exploratory Data

After collecting the exploratory data, it had to be analysed to facilitate further research stages. The first step was to decide whether computer-assisted (or computer aided) qualitative data analysis software (CAQDAS) such as NVivo or NUD\*IST (Non-Numerical Unstructured Data Indexing, Searching and Theorising) shall be used or not. Leybourne (2002, 10), compared the advantages and disadvantages of using CAQDAS and concluded that 'qualitative analysis software can only assist, rather than undertake the level of rigorous analysis required.' In addition, much time is needed to learn and be skilful in using new software. Hence, the use of CAQDAS was not taken into further consideration. Nonetheless, a rigorous way of analysing the data from the qualitative interviews had to be found. Saunders et al. (2007, 492) describe a number of inductively-based analytical procedures to analyse qualitative data and one of them will be described below.

**Figure 5.2: Interactive Data Analysis Model**



Source: Miles and Huberman (1994, 12)

Miles and Huberman (1994, 10) used an interactive data analysis model (Figure 5.2) and define analysis as 'consisting of three concurrent flows of activity: data reduction, data display and conclusion drawing/verification'.

- Data reduction: 'refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up field notes or transcription'.
- Data display: 'designed to assemble organised information into an immediately accessible, compact form so that the analyst can see what is happening and either draw justified conclusions or move on to the next step of analysis the display suggests may be helpful'. There are two main forms of data displays – matrices and networks.
- Conclusion drawing and verification: refers to 'noting regularities, patterns, explanations, possible configurations, causal flows, and propositions'. Meanings emerging from data have to be tested for their validity.

Saunders et al. (2007) point out that the interactive data display model differs from grounded theory in that the framework is not specified. The approach of Miles and Huberman (2002) is suited to an inductive strategy to analyse qualitative data.

Meuser and Nigel (1991) suggested that qualitative interviews with experts are most effective when analysed by using six subsequent steps. First, the interviews have to be transcribed. The authors pointed out that only the relevant passages have to be transcribed and that a system of notification is not essential. Second, the interviews have to be paraphrased and relevant

passages have to be clustered according to the various subject themes. Third, a headline should then be added to the paraphrased passages. Fourth, the researcher reaches the level of the individual case by comparing the headlines and passages of the individual interviews with one another. After that sociological drafting takes place by linking the primary data with sociological terminology. The final step is the theoretical generalisation of the results.

Both methods provide useful techniques in analysing the collected data. For the purpose of this research, both methods have been combined into a five-step analysis process.

#### Step 1: Transcription

After the exploratory interviews had been conducted, the tapes were transcribed within two days by the author in order to get clarity and a feeling for the data even though the literature suggests that interviews can be transcribed by other people than the researcher.

#### Step 2: Creation of themes

The author read through the transcribed notes several times to get a feeling for the data and content. Notes and comments were made for each interview, after which compared against each other. These led to the creation of relevant themes and research subjects/questions in conjunction with the literature review.

#### Step 3: Selection of statements and allocation to specific themes

After the themes had been created, the transcriptions were read through again in order to obtain relevant statements. These statements were allocated to the specific themes.

#### Step 4: Comparison of statements within the specific themes

The individual statements within the specific themes were compared with each other to distinguish similarities and differences.

#### Step 5: Conclusions and Development

From the data generated in previous stage, statements were compared with the literature to develop conclusions to build research questions to aid in the next stage of data collection.

### **5.2.2 Qualitative Interviews**

The whole process of collecting qualitative research data took place over a period of six months divided into three phases. In the preparation stage, a sample was created by means of content analysis. Then the questionnaire was designed and pilot tested before it was sent out and collected. The last stage includes analysis of the questionnaire interviews.

#### **5.2.2.1 Preparation Phase – Creating a Sample**

When conducting a survey, one of the most important steps is to select a suitable sampling frame. The benefits include ensuring accurate and reliable results. Researchers have the choice between conducting a census or choosing a sample survey. Bryman and Bell (2007, 182) define census as the 'enumeration of an entire population which involves data collection in relation to all units in a population, rather than in relation to a sample of units in that population'. The initial plan was to conduct a consensus of experts on DPRK hence an accurate and up-to-base database on all experts were needed.



However, there are no such lists of names and addresses available. As such, a list had to be specifically created by the researcher. Therefore a content analysis was carried out.

The first step was conducted during the literature review stage where a list of authors, who have published books, journals, magazines and newspapers on topics relating to DPRK were collected and analysed. Topics relating to science and arts were rejected due to the nature of this research. At this juncture, a total of 140 potential experts were found. The next step included an analysis of websites related to DPRK. More potential candidates were found as a result of extending the search from the initial list of candidates, whose organisation websites included other DPRK experts, as well exploring research think tanks (e.g. USA and UK) and universities offering DPRK studies located worldwide. During the course of collecting the survey interviews, respondents also offered names of other experts not covered during the two stages of analysis. Finally, a total of 150 experts along with their email and postal addresses were compiled.

#### **5.2.2.2 Designing the Questionnaire**

This section deals with issues related to questionnaire design (i.e. lay-out considerations, length of questionnaire, covering letter and pilot testing) whereas questions relating to the questionnaire (i.e. questions relating to the research areas) will be dealt with in later chapters.

Neuman (2006, 277) noted that a good questionnaire ‘avoids confusion and keep the respondent’s perspective in mind’. Saunders et al. (2007, 356) notes that the design of the questionnaire will affect the response rate and the reliability and validity of the data collected. They emphasise that careful design

of individual questions, a clear layout of the questionnaire form, a lucid explanation of the purpose of the questionnaire, pilot testing and a carefully planned and executed administration of the survey are crucial points in reaching a good response rate and ensure validity and reliability.

The length of the qualitative survey was always an issue. As this is an inductive qualitative research, the objective was to gather the opinions of experts from all over the world, the length of the survey would be longer than usual. However, Saunders et al. (2003) recommended that a questionnaire between four and eight A4 pages. Hence, care was taken to ensure that it is no longer than eight A4 pages. In order for the questionnaire to be manageable for the respondents, the questions were separated into different themes.

May (2001, 10) emphasise that 'the most important part of the actual design of questions is to construct them unambiguously and to be clear in your own mind what the question is for, who it is to be answered by and how you intend to interpret them.' Bryman and Bell (2007) also lists several rules for designing and wording the questions, including bearing in mind the research questions, avoiding long and general questions, using simplest language possible to convey the meaning of the question, eliminating vague words in order to avoid vague answers and ensuring that the respondents have the necessary knowledge to answer the questions. As it is an inductive research, open-ended questions were used to allow respondents to give their answers in their own way. The questions also do not suggest certain kinds of answer to respondents resulting in the ability to tap the levels of knowledge and understanding of issues. The questions were derived from the literature search and exploratory interviews conducted in the first stage.

The cover letter, which explains the purpose of the survey and sought to obtain cooperation from potential respondents, is as important as the survey itself. Dillman (2000) noted that a covering letter will affect the response rate. As the qualitative survey is being conducted through electronic sources, the pre-contact e-mail served as the covering letter. This includes a personal salutation as all the respondents are known by name; a brief introduction of the researcher and the description and purpose of the research project; a reassurance of confidentiality and anonymity and finally contact details of the research 'team'. The statement of confidentiality and anonymity protects respondents' identity but also increases their willingness to take part in the survey (Bryman and Bell 2007 and Saunders et al. 2007). Respondents were offered a summary of the findings as an incentive. A copy of the covering e-mail can be found in Appendix IV.

Pilot testing is not solely to do with trying to ensure that survey questions operate well, as it also has a role in ensuring that the research instrument as a whole functions well (Bryman and Bell 2007). Oppenheim (1992, 64) adds that 'studies which have been adequately piloted, or not piloted at all, will find that a great deal of effort has been wasted on unintelligible questions and uninterpretable results.' Because of the relatively small sample size, it was decided to test the survey on the eight interview respondents in the exploratory interview stage as well as three academics from Plymouth Business School/UK. All pilot testers were contacted and asked whether they were willing to test the qualitative survey. They then received an e-mail with the survey attached. They were asked to assess whether the questionnaire flows, the instructions are adequate, the wordings of the items and format are clear, and the survey takes

a reasonable time to complete it. On the length of the questionnaire, some experts suggested deleting some questions to ensure that the time taken to complete is not too long. One expert mentioned that he took an hour to complete the pre-tested questionnaire while the shortest time was 20 minutes. Experts and academics were happy with the layout and wording of the questions. All in all, the pilot testing proved to be useful, as modifications according to the recommendations of the pilot testers improved the quality of the final survey (Appendix V).

The final qualitative interview relates to research question 1 and 3-6 covering the following five themes – politics, economics, infrastructure, managerial and spatial. The questions have been developed through analysis of the exploratory findings and literature review.

RQ1 is linked with politics, economics and infrastructure. Under politics, experts were asked to comment on DPRK's political situation with the countries in the six-party talks and the interests/strategies of the respective countries towards DPRK. Experts were asked to give their opinions on the most likely scenario to take place in DPRK within the next five to seven years. The possibility and process of a reunified Korea was proposed to the experts together with the drivers of political change in DPRK. Under economics, experts were given three scenarios and asked to comment the economic strategies needed and the potential financial sources under each.

RQ3 is linked with the infrastructure theme. Experts were asked to rank the transport infrastructure priorities for DPRK amongst seven factors.

RQ4 is linked with the managerial theme where experts ascertain the possibilities of DPRK managers assuming managerial positions in the future and the different skills and knowledge which their managers can acquire.

RQ5 and RQ6 are considered under the spatial theme where experts were asked to commend the different industries that DPRK can focus in and the main markets for DPRK -made products.

### **5.2.2.3 Distribution of Questionnaire**

After the process of designing the final questionnaire was completed, the next step was to decide on the distribution method. In addition, the timing of questionnaire distribution must be considered as well as it might have an impact on the response rate. Gillham (2000, 46) suggests 'avoiding mailings at holiday periods or when organisations are likely to be closed, or exceptionally busy'. In view of this consideration, it was decided to approach the experts in March 2007.

The next decision relates to the actual distribution method of the questionnaire with the options being between online and/or postal methods. Online questionnaires can be administered via e-mail or a website. The latter option was not considered due to the time, effort and problems in creating a website. In some instances, the website might be incompatible and inaccessible due to security restrictions on the computers. The remaining options are electronic mail and/or postal distribution. Eriksson and Kovalainen (2008, 104) highlighted the following advantages and disadvantages of using e-mail questionnaires, which is increasingly popular as a reliable research method. Advantages

include - the relative low cost as it saves on postal charges; access to geographically dispersed population; access to individuals or groups who are difficult to reach; and response time is shorter as the mailing route becomes irrelevant. However, the disadvantages are – lack of interest and motivation; distrust in confidentiality; landing in ‘spam file’; and a relatively new method in research. Postal questionnaire offers the advantage of anonymity and avoid interviewer bias. On the contrary, they have low response rates and researchers cannot control the conditions under which the questionnaire is conducted resulting in response bias. Griffis et al. (2003, 255) conducted a study comparing the differences between web-based and mail survey methods and found that web-based surveys are ‘comparable in quality and achieve quicker response as well as somewhat higher response rates, with the added ability to collect valuable information about the respondent’s survey completion process’. Cobanoglu et al. (2002, 442) whose research also found that web surveys have faster response rates, noted that ‘research on mixed-mode surveys has suggested that employing more than one method for collecting survey data is acceptable and usually yields a higher response rate’. It was decided that e-mail surveys would be the main distribution method supplemented by postal survey where there is non-response from the list of experts.

In preparation for the e-mail survey, the research followed the guidelines suggested by Saunders et al. (2007, 390). In March 2007, a pre-survey email (Appendix IV) was sent individually to the initial 150 potential candidates to seek their consent to participate in the survey. The email included a brief introduction of the researcher and the University as well as the purpose of this

research. It also included the option of receiving a copy of the research findings upon completion of the research. After the first round of pre-survey contact was sent out, a mixture of responses were received. Some e-mails returned as 'not deliverable' while there were non-responses and those who rejected to participate in the survey. A second e-mail was sent out two weeks later to those experts who did not respond to the initial e-mail. Finally, a postal questionnaire was sent out four weeks after the pre-survey contact, to all the non-respondents who did not respond to the first and second e-mail although the effect was not great with only few experts responding positively. The first batch of e-mail questionnaire was sent out together with a covering e-mail at the end of March 2007. The importance of follow-up e-mails for increasing the response rate was mentioned by various authors (Bryman and Bell 2007; Collis and Hussey 2009 and Saunders et al. 2007). The first follow-up e-mails were sent out two weeks later to all recipients thanking early respondents and reminding non-respondents to answer with a copy of the questionnaire included. Three weeks later, a second follow up e-mail was sent to those who had not responded. At the same time, 10 new potential experts were provided by other respondents so a new batch of emails was sent out periodically between April and June 2007. The overall response rate will be discussed in the next section.

#### **5.2.2.4 Response Rate**

Easterby-Smith et al. (2008) note that one of the factors that will affect the quality of the data provided is the relevance of the research to the interviewees. Most respondents showed a high interest in the research project. This is illustrated by the fact that a majority of respondents (60.5%) indicated that they were interested to receive a summary of the findings.

After the pre-survey contact, a total of 50 experts responded positively by indicating that they will be willing to take part in the survey and questionnaires were sent to them together with a covering letter. Seventeen e-mail addresses returned a 'not deliverable' response and efforts were made to trace updated e-mail and postal addresses where possible and new pre-survey contact emails were sent. There were 43 non-responses and postal surveys were sent to their available addresses. 30 experts chose not to participate in the survey by replying that they have either 'retired', 'have not conducted research on DPRK for a long time', 'do not have time' or 'not interested in the research project'. A further 10 experts were contacted after their contacts were given by earlier respondents and three of them responded positively.

After the first round of surveys was collected after two weeks, 18 questionnaires were returned. The two follow-up e-mails proved to be a good tactic, with a further 20 additional questionnaires returned. However, some of the initial experts who responded positively did not return the questionnaires after two follow up e-mails. All in all, 38 (which is 31.6%) out of a possible of 120 experts responded.

#### **5.2.2.5 Analysing Qualitative Data**

After collecting the primary data, it had to be analysed to answer the research questions and to facilitate the next stage of research. In this stage, the analysis follows a three-step process.

##### Step 1: Review of Transcripts

Notes and comments were made for each individual interview.



### Step 2: Selection and Comparison of Statements

The transcripts were read through again in order to select relevant statements. The individual statements within each specific subject themes are then compared with each other in order to filter differences and/or similarities.

### Step 3: Conclusions

From the data generated in previous stages, conclusions were drawn. These conclusions were then used to answer the research questions developed earlier.

#### **5.2.3 Quantitative Survey**

The quantitative research phrase was conducted concurrently with the qualitative phrase. It took several months to complete and was partially conducted in ROK. The author received a scholarship from the Korea Foundation to conduct research in ROK. The author was attached with a Korean research institute, whose Korean researchers assisted in translating the survey and also provided a forwarding address for the questionnaire to be received. The main reasons of surveying ROK SMEs and logistics companies are the difficulty of entering into DPRK to collect any reliable data and any investment in DPRK would be conducted by ROK and foreign companies. ROK companies were selected based on the ease of access as compared to Chinese or Russian companies. ROK's main political interest in DPRK is to ensure peace in the peninsula and also to boost DPRK's economy. In the event of a reunification or collapse, many experts interviewed earlier believed that ROK, together with China would be the country that will invest the most in DPRK. At the moment, ROK has established an industrial complex in Kaesong,

just across the border of ROK. Economically, SMEs have a strong interest as it helps to lower their operational costs through cheaper land and labour costs.

This quantitative research process has been carried out in various stages. First, a sample was created. The questionnaires were designed and pilot-tested before being distributed and collected. The last stage involved data preparation and analysis to test the research questions and scenarios developed after the qualitative research stage. All these stages will be described in the following sections.

#### **5.2.3.1 Preparation Phase – Creating a Sample**

At present, ROK SMEs form the majority of the companies investing in Kaesong and other parts of DPRK. Hence, the initial plan was to survey ROK SMEs. According to the Korean Federation of Small and Medium Business, an enterprise is defined as a SME if it has less than 300 workers. In addition, for each industry, the capital and sales are capped at different amounts. For example, in the manufacturing industry, the enterprise should have a capital worth of US\$8million or less. A table with the different sectors including the number of workers and capital and sales are included in Appendix VI. According to the Korea Federation of Small and Medium Business, there are about 3 million SMEs in ROK, which also corresponds to the possible sample size of our research. Due to time constraints of the research process and difficulty in obtaining membership lists from the SME business organisations, it was not possible to sample all of the SMEs. On the advice of the ROK research institute that the author was attached with, it was decided to create a list from those SMEs who have expressed an interest in investing in DPRK. The main reason being they are more likely to invest in DPRK and their

decisions/opinions will have an effect on the policies surrounding DPRK. With the assistance of the research institute, the author managed to obtain a list of potential investors who have expressed an interest in investing in DPRK, from the corporation in charge of developing the Kaesong Industrial Complex. The list includes the names of CEOs or high level managers, postal addresses and contact details of the companies. A breakdown of the overall sample and their sectors is listed in Table 5.1.

According to private sources, a number of ROK logistics and shipping companies have conducted businesses in various parts of DPRK. Through the Korean International Freight Forwarders Association, a list of logistics companies who have had previous experiences in DPRK and those who expressed interest in investing in DPRK, were obtained. The list includes the names of CEOs or high level managers, postal addresses and contact details of the companies.

**Table 5.1: Sample Frame for the Quantitative Survey**

<b>Sectors</b>	<b>Number of Companies</b>
Hotel	10
Transportation/Equipment	18
Finance	20
Non-metal products	20
Minerals/Ore	20
Information Technology service	23
Leisure (tourism/golf)	24
Agricultural	25
Basic metals	25
Information Technology	25
Petroleum/Chemical	25
Machinery	28
Food Processing	30
Paper and Pulp	30
Electrical/Electronics	90
Textile	90
<b>Total</b>	<b>506</b>

Source: Korea Federation of Small and Medium Business

### **5.2.3.2 Designing the Questionnaire**

This section will discuss issues related to questionnaire design whereas specific details related to the actual content of the questionnaire will be dealt with at a later chapter. Hague (1993, 41) listed eight rules guiding the framing of the questionnaire. Firstly, the researcher should think about the objectives of the survey and how it will be carried out. Respondents' knowledge and interest is also an important factor as it will determine whether they will respond to the questionnaire. A good covering letter is important as it will capture the attention of the reader. Next, the order and types of questions is also important as it will affect the possible answers and also how the data will be processed.

Saunders et al. (2007, 358) note that the length of the questionnaire should be restricted to six-eight A4 pages with the maximum of twelve pages as deemed feasible by Gillman (2000). Rea and Parker (2005, 46) notes that 'the purpose of being sensitive to questionnaire length is to make certain that the questionnaire is not so long and cumbersome to the respondent that it engenders reluctance to complete the survey instrument, thereby jeopardising the response rate.' It is recommended that for postal questionnaires, the time to complete it should take less 30 minutes or less. The aim of the research was to restrict the questionnaire to five-six A4 pages in the form of a user-friendly booklet. Layout of the questionnaire is also an important factor. Instructions should be orderly and clear so that respondents can fill in the questionnaire conveniently.

Designing and wording the questions can be a tedious process which requires putting careful thoughts into the whole process. Bryman and Bell (2007) classify

the types of questions into several categories. First there are personal factual questions, i.e. personal information such as age, gender, education, employment status, income etc. Second, there are informant factual questions, i.e. respondents are placed in the position of informants rather than answering questions about themselves. They are asked questions about the size of the organisation they work for, who owns it etc. Next, there are questions about attitudes. Likert scale is one of the most frequently used formats for measurement. Fourth, there are questions asking respondents' beliefs. Fifth, there are questions about normative standards and values. Lastly, there are questions to 'test respondents' knowledge in an area. This research will use questions related to personal and informant factual questions and questions about attitudes and beliefs. Saunders et al. (2007) highlighted six types of closed questions. First, respondents may be offered a list of items, any of which may be selected. Second, respondents may be asked to select only one response from a given set of categories. Third, respondents may be asked to rank items. Fourth, rating questions are used to collect opinion data. Fifth, quantity questions are used to give the amount of a characteristic, e.g. year of birth. Finally, there are grid questions recording responses to two or more similar questions at the same time. With the exception of the fifth and sixth category, all other categories have been used in the questionnaire.

The importance of a good covering letter has been discussed earlier. A covering letter must be carefully designed as it helps to seek cooperation from respondents and it is the first thing which they see when they receive the postal package. The covering letter includes the University logo to emphasise the seriousness of the project, a personal salutation (whenever the name of the

contact was known), a brief description of the research project, clear instructions on what to do, reassurance of the confidentiality and anonymity, and contact details of the researcher. A summary of the findings was offered as an incentive as this is normal practice in academic surveys.

Pilot testing is a crucial stage of every questionnaire survey as it enables one to 'refine the questionnaire so that respondents will have no problems in answering the questions and there will be no problems in recording the data' (Saunders et al. 2007, 386). Due to the small sample size, it was decided to test both questionnaires on ROK researchers, business and government officials rather than on the sample members. The pilot size involved 25 people, mainly ROK researchers in the research institute where the author was based, and several officials from business organisations and the government. All pilot testers were contacted either by telephone or e-mail beforehand to ask their participation in testing the questionnaire. They then received the covering letter, the actual questionnaire (in Korean and in the form of a booklet), and a 'Free Return' addressed envelope by post. They were asked to comment whether the questionnaire flows, the instructions are adequate, the wordings of the items and format are clear, and the survey takes a reasonable time to complete it. All of the pilot testers were happy with the length of the questionnaire as it took them between 15-30 minutes to complete the questionnaire. Some suggested re-wording some questions regarding the section on 'factors affecting the organisations decisions to invest in DPRK as it appears ambiguous. Most are happy with the layout of the questionnaire. The pilot testing proved to be a valuable exercise as the modifications according to the recommendations of the pilot testers helped improve the quality of the final questionnaire.

The first page of both questionnaires covered questions regarding the companies' characteristics. Both questionnaires begin with a question relating to the size of the companies. The companies were asked about their annual revenue in the previous year. One questionnaire in the SMEs questionnaire inquired about the industries the companies were associated with. A similar question was asked in the logistics companies' questionnaire about the types of industries served.

RQ2 is linked with question nine in the SMEs questionnaire. Respondents were asked to state their location preference for future investment in DPRK.

RQ3 is considered in question eight in the SMEs questionnaire where respondents were asked about the main transport mode when exporting goods out of DPRK.

RQ5 is linked with question seven in the SMEs questionnaire where respondents were asked to indicate the export destination of their products.

RQ6 is linked with question five in the SMEs questionnaire. Respondents were asked to list up to three industries to be invested in DPRK.

RQ7 incorporates a block of factors in question eleven of both the questionnaires relating to the importance of each factor when considering the organisation's decision to locate investment in DPRK. In order to generate data to test the research questions, scales for the eight themes as well as a measurement needs to be included. There are two options – drawing from existing studies and creating new scales. Bryman and Bell (2007) stated that it

is a common practice to use pre-tested variables as it enables the researcher to make comparison with other studies. On the other hand, if such variables do not exist or do not serve the purpose of the research, it is advisable to create new variables based on the understanding of the research topic and develop 'measures which have desirable reliability and validity properties' (Churchill 1979, 65). This research uses a mix of pre-tested variables and new variables as the author felt that this research is unique and not replicable entirely through the use of another study. All variables were subject to discussion in the pilot testing phase and minor changes to the wordings were made on the advice of some pilot testers. Appendix VII and VIII lists all questions relating to the 58 variables under eight themes asking respondents to state the importance of the location determinants on a 5-point-Likert-scale. The following paragraphs discuss the variables.

*Politics* have been measured in many different ways. MacCarthy and Atthirawong (2003) used four items measuring stability, structure, consistency of policy and attitude towards investment. Oum and Park (2004) only used two variables – pro-business government and officials and political stability. Bhatnagar and Sohal (2005) used eight variables including stability of government policies, protection of foreign investment and level of government support. Attitudes of local and state governments have been measured as a factor which is closely linked to the level of bureaucracy (Galbraith and De Noble 1988). Adis (2005) in the study on transition economies such as Lithuania used the level of corruption as a measure to determine political risk. In view of the above studies, this study has incorporated six variables, including two new variables for political theme. '*Government and officials support*



*businesses* have combined several measures such as presence of support agencies and level of government support. Under '*political stability, with nuclear issue resolved*', consideration was given to the current situation where experts in the exploratory study commented that solving the nuclear issue is of utmost importance. A new variable was created with the tensions in the Korean Peninsula with the interests of other stakeholders such as China and the USA in mind, this variable '*Regional Stability*' measures how important it is desired. 'Bureaucracy is not excessive' refers to the levels of red-tape with the local and state government. The perception on corruption is important for DPRK where corruption is prevalent in transition economies like China and Vietnam hence the measure of '*the risk of corruption is low*'. The last variable, '*there is potential for unification*', measures the possibility that with the unification of both Koreas, FDI will increase.

*Economic* sub-factors encompass thirteen variables which are partly adopted from various studies with new variables created. '*SEZs*' and '*competitive financial sector*' was adopted from Oum and Park (2004). Availability of SEZs will attract potential investors with economic incentives while a competitive financial sector provides assurance to investors that there are interest rates is competitive and not monopolistic. '*Clustering of common industries*' has been advocated in many location studies as a determinant for location choice. 'Good levels of local and regional development', a new variable, measures whether development in areas other than Pyongyang and Kaesong will attract potential investors. '*Reforms encouraging a market economy*' and '*an open market economy*' ascertains the importance of a market economy on potential investors as DPRK maintains a military-first economy which is only aimed at keeping the

military strong. 'Low levels of exchange rate risk' and '*few currency restrictions*', which has been used by Urata and Kwai (2000), refers to the volatility of exchange rate and the ability of investors to transfer money out from DPRK. '*Culture which encourages high profits*' affects the profits of investors. Since July 2002 reforms, managers are encourage to make profits for their entities. '*Low set up costs for new local establishments*' and '*state financial incentives*' focuses on the policies which encourages investors to set up business with low costs and more tax incentives.

*Infrastructure* measures the availability of transport facilities, energy, telecommunications and logistics facilities. This study adopts the measures used in MacCarthy and Atthirawong (2003) which covers the access to airports, rail, road, ports; supplies of energy and water; access to domestic markets; telecommunications infrastructure; and logistics facilities.

*Legal* covers seven sub-factors which have been partly adopted from MacCarthy and Atthirawong (2003) and Oum and Park (2004) and newly created variables as neither study was deemed to have covered the appropriate measures. MacCarthy and Atthirawong's (2003) measures covered '*laws governing logistics practices*', '*payment methods are flexible*', '*clear rules governing regulations and contracts*' while Oum and Park (2004) used '*immigration policies are flexible*' and '*personal income taxes for foreign employees are low*' as their measure of regulatory framework. The last two measures, '*labour and tax laws do not change suddenly*' and '*new regulations are not suddenly imposed*' are added due to the nature of doing business in DPRK where it has been found that wages of local workers were increased

without any pre-warning and regulations were imposed on ROK companies in Kaesong.

*Managerial* sub-factors are newly created variables based on the analysis of the literature and exploratory study. Investors are asked to consider the importance the DPRK managers have '*good knowledge of logistics concepts*', '*sufficient management experience*', '*good knowledge of management concepts*' and '*are keen to accept new technologies*'.

*Spatial* covers ten sub-factors with focus on market related variables. Some of the variables were taken from Bhatnagar and Sohal (2005). These include – '*good supply of plentiful and cheap land*', '*close proximity to markets*', '*availability of raw materials*', and '*proximity to major suppliers*'. Newly created variables which are specific to DPRK include the following - '*Gaining a bridgehead into the DPRK markets*', '*promise of new markets for DPRK products*', '*availability of natural resources*', '*lack of sizable markets*', '*limited purchasing power of local markets*', and '*good access to markets in China and Japan*'.

*Social* comprises of six sub-factors which assess the quality of life and cultural factors. All except one, '*Cultural affinity with other Koreans*' was adopted from MacCarthy and Atthirawong (2003). The new variable assesses the historical links between both Koreas. Other measures include – '*good housing, schools, environmental amenities*', '*a pool of educated labour with requisite skills*', '*common culture and language*', '*availability of industrial estates*' and '*good supply of low labour cost*'

*Organisational* comprises of three sub-factors which has been partly adopted from Oum and Park (2004). 'Plentiful modern logistics service providers and costs' have been viewed as an important factor in assessing logistics companies' decisions in locating warehouses in Northeast Asia. Other measures added include – '*good logistics linkages and accessibility*' and '*good logistics distribution system*'.

RQ8 is linked with question five and seven to nine in the logistics companies' questionnaire. Respondents were asked to tick three types of logistics services being provided in their organisations. They were also asked to indicate, if any, any past or present logistics operations in DPRK. For those who indicated positively, they were inquired about the locations covered as well as volume transported.

The fifth and last page of both questionnaires covered questionnaires scanning managers' characteristics. Respondents were asked to fill in their job title to identify their position in their organisation. They were also asked to tick their experience in the industry and their organisation.

#### **5.2.3.3 Distribution of Questionnaire**

After the process of designing of the questionnaires (Appendix VII and VIII) has been completed, the distribution was carried out. Several factors need to be considered when deciding on the distribution – timing and distribution method. The distribution processes started in August 2007 and was completed in January 2008.

A decision had to be made concerning the actual distribution method of the questionnaires, i.e. self-administered and interviewer-administered questionnaires. The former include internet-mediated, postal and delivery and collection questionnaires while the latter include telephone questionnaire and structure interview. The advantages and disadvantages of online and postal questionnaires have been discussed in earlier. Delivery and collection questionnaires are similar to postal distribution. They have the additional advantage of higher likelihood of response rate due to respondent participation in delivery and collection. However it is time consuming due to the distance and time needed to travel to each likely candidate in the sample. Telephone questionnaires ensure rapid data collection, possible costs savings, greater anonymity than in-person interview and assurance that instructions are followed. However, it is difficult to establish credibility and trust with respondents over a telephone and the interviewer has less control over the interview situation as the respondent can easily end the interview at any time. Web-based questionnaires, delivery and collection questionnaires, and telephone questionnaires were rejected due to several reasons. The web-based questionnaire option was abandoned because of the time and problems in developing a web-base questionnaire. Delivery and collection was rejected as the SMEs and logistics companies are spread out all over ROK and the time and distance incurred in travelling to each respondent will result in high costs. Telephone questionnaires were abandoned due to the lack of credibility resulting in low response rates. The choice was therefore limited to e-mail distribution and postal distribution. The list obtained did not contain the e-mail address of the CEOs/general managers hence efforts were made to contact the company through telephone to obtain their e-mail addresses. However, many of

the companies were unwilling to provide these details. Hence, the postal distribution method was chosen.

The postal package comprised of the covering letter, the actual questionnaire (in Korean and in the form of a booklet), and a 'Free Return' addressed envelope, which is more cost-efficient in comparison to stamped envelopes, as only the actual responses are charged. A 'Free Return' envelope also makes it easier and more convenient for the respondent to return the questionnaires. A total of 503 postal and 250 packages for SMEs and logistics companies respectively were sent out on 1 August 2007. The importance of follow-up letters for gaining a higher overall response has been advocated by various authors (Bryman and Bell 2007, Gillman 2000 and Sauders et al. 2007). Following the recommendations by Dillman (2000), a special covering letter was created for the second and third mailing, highlighting the importance of their contribution to the research and reiterating the objectives of the research project. Additional mailings in October and November 2007 led to an improved overall response rate, which will be discussed in the next section.

#### **5.2.3.4 Response Rate**

A total of 503 and 250 questionnaires were sent out to the ROK SMEs and logistics companies respectively in the first batch, of which 25 SMEs and 20 logistics companies' completed questionnaires were returned. The first follow-up letters four weeks later proved to be a good strategy, with a return of another 40 SMEs and 20 logistics companies' questionnaires. A second follow-up letter was sent five weeks after the second batch to encourage more response, another 15 SMEs and 10 logistics companies' questionnaires were received. All

in all, 88 (17.5%) SMEs and 50 (20%) logistics companies responded. Out of 88 SMEs, eight responses were excluded due to incomplete data. Finally, 80 usable responses remained in the database. All logistics companies' questionnaires remained usable. The rest of the companies were contacted and asked for their reasons for not responding to the questionnaires. Some of the reasons given included lack of time of the CEOs/managers, a corporate policy of not filling in any questionnaires and no interest in the research project. Even though the response rate is lower than recommended, it is acceptable due to the sensitive nature of this research. In addition, no similar studies have been conducted in these areas previously.

#### **5.2.3.5 Analysing Quantitative Data**

After the quantitative data collection process has been completed, the data analysis process began. This section provides a brief overview of the data analysis process and techniques used. The choice of analysis methods is determined by the research questions and hypotheses. Hair Jr. et al. (2007) recommend several steps before conducting data analysis. First, the conceptual framework and relationships to be studied should be reviewed. Secondly, the data obtained from the questionnaire survey should be prepared for analysis. This includes data coding and recoding, checking for any errors or non-responses to questions. SPSS has been chosen as the software for data preparation and analysis. Third, descriptive statistics such as frequency tables and cross-tabs are used to describe the characteristics of the sample size. Data relating to the research questions have been analysed using sound statistical methods, i.e. multivariate analysis, in order to examine the relationships, differences and trends between variables. Subsequent analysis was carried out

using factor analysis (in the form of a principal component analysis) in order to reduce the data set and to identify the underlying factors determining ROK SMEs' and logistics companies' investment in DPRK.

### **5.3 Ethical Considerations**

A pragmatic research philosophy has been adopted to tackle multifaceted research questions, which require mixed methods. The relativist view of ontology which was selected raises a range of ethical issues relating to both data collection and analysis. The nature of the focus of interest in DPRK is inevitably controversial, with limited information available and substantial scope for suspicion of motivation amongst respondents, gatekeepers and authorities. For these reasons, some of the ethical considerations are reported here.

With a very limited numbers of experts to draw on, a clear ethical policy guided both the scope of questions discussed with experts, and the process of conducting interviews, and recording and analysing data. Inevitably the recruitment method employed in preliminary interviews involved theoretical sampling to glean the range of expert views available.

A protocol was established which reflects both the sensitivity of dealing with both a sensitive regime and a requirement to respect the rights of respondents and their views relating to sensitive issues. The protocol for managing interviews differed slightly from that for managing questionnaire surveys because of pragmatic differences in philosophy and data collection processes in each phase of the research, but the same principles underpinned both.



To ensure that informed consent was obtained, the intended participants were fully informed about the nature, purpose and use of research and their role within it. All participants were volunteers and were briefed clearly before meeting as to the purposes of the research and why their input is considered valuable. They were informed about the type of information being collected and how it would be used to further the research. Given the limited prior published material, a relatively informal inductive variant of grounded theory was applied to analyse interviews and identify issues to develop in later interviews.

Openness and honesty protocols were implemented by explaining the scope of the project, and its objectives in a clear and transparent manner, and intentions for using the research data gathered.

All participants were offered the right to withdraw at any stage in the process, and as willing volunteers, no conditions attained to qualify this right. Interviewees were informed that they had the right to withdraw from the research at any time, and that their data will be removed and destroyed upon their instruction. Protection from harm considerations were not directly applicable, except possibly in that all interactions remained confidential to researcher and participant, and neither the occurrence, timing nor content of any engagement was released to any third party.

In terms of debriefing, an executive summary of the outcomes of the research project was offered to questionnaire survey participants who requested it, but although this was not possible in interviews, any reasonable requests for information by participants were offered as fully and openly as possible.

Given the inherent sensitivity of research within the area of security certain ethical considerations need to be stressed prior to conducting research involving a third party. At no point did any issues raised come within the scope of for example the Official Secrets Act and hence no vetting, clearance or caveats involving organisations or nations were required. To ensure the confidentiality of responses, formal coding of interviews and pre-interviews was avoided, relying on an informal process of model building which removed any scope for third party interference or disclosure of potentially sensitive information. Given that the purpose of the qualitative phases of data collection were essentially problem framing and scenario building, any superficial loss of rigour attributable to this process was much less significant than ensuring confidentiality and hence encouraging maximum participation in the research process. Throughout the data collection process, the inalienable rights of participants to privacy were paramount, as summarised by Saunders (2007 607) “relating to the rights of individuals not to participate in research and to their treatment where they agree to participate.”

#### **5.4 Summary**

This chapter began with an overview of the different research approaches. It went on to describe the research philosophy and strategy employed in this thesis, justifying the choice of research methods. A mixed methods approach is employed using qualitative and quantitative approaches. A summary linking the research questions to the qualitative and quantitative questions can be found in Table 5.2 below. The next chapter describes the results and discusses the exploratory study which helped in obtaining further insights into DPRK.

**Table 5.2: Linking research questions to questions in qualitative and quantitative questionnaires.**

RQ	Experts	SMEs	Logistics Companies
1	Politics/Economics		
2		Q9	
3	Infrastructure	Q1, Q3, Q5, Q8	
4	Managerial		
5	Spatial	Q7	
6	Spatial	Q5	
7		Q11 (a) – (h)	Q11 (a) – (h)
8			Q5, Q7-9

## **CHAPTER 6 – THE RESULTS AND DISCUSSION OF THE EXPLORATORY STUDY**

This chapter presents the results of the exploratory study based on eight face-to-face interviews. As mentioned earlier in the previous chapter, these interviewees in UK and China were chosen as a result of time and financial constraint as well as their knowledge and expertise on DPRK in various fields such as politics, market research, economics, humanitarian aid and foreign investment. The presentation of the qualitative data includes some direct quotes from the interviewees in order to support views and to illustrate the results. The quotations are stated anonymously, but with a specific reference to the group of interviewees. The qualitative data were analysed using a five-step approach. During the course of analysing the exploratory data, several themes emerged – politics; economics; infrastructure; managerial; spatial and social. Two further themes, legal and organisational, emerged after further analysis of the literature after the exploratory analysis.

### **6.1 Politics**

This section deals with the political issues surrounding DPRK, with particular reference to the Korean Peninsula. Interviewees were asked to comment on the main political issues affecting the developments in the Korean Peninsula. Several interviewees agreed that the nuclear issue is the immediate issue to be resolved in order for the country to move forward economically. However, the nuclear issue is only a subset of the larger problems which besets DPRK. Any long term reconciliation and investment is dependent on the nuclear dispute being resolved.

Immediate one is the nuclear issue...I see it as a subset of a larger set of questions about the future of DPRK, how it will adapt, whether it will adapt, (and) how it will become more peaceful.

[Expert – UK]

Security and weapons of mass destruction are not the only issues. It's the question of the relationship between the two Koreas. Not just in terms of security but in terms of the economic links between both countries.

[Ex-Government Official – UK]

Another interviewee mentioned the importance of the relationships between DPRK and the other countries in the six-party talks – USA, China, Japan, Russia and ROK.

The USA and its other four interlocking sides have their priorities, obviously, non-proliferation...matching and co-ordinating the interests of five powers, who all have their own slightly different calculations of their own interests, is not something that will produce an instant solution.

[Government Official – UK]

As mentioned by the expert, all five countries have their own interests and stakes in DPRK, cumulating in different possible scenarios for DPRK. The USA and ROK would desire peaceful unification on ROK terms and integration while China would prefer the status quo scenario. Other scenarios mentioned were – collapse and absorption and military conflict. Another expert stated that the most likely scenario would be a collapse and unification in the Korean Peninsula as the economic situation DPRK is in dire straits, leaving the citizens unable to feed themselves. Another argument was put forward advocating 'reunification by stealth'.

They try to take various strategic bits of the DPRK economy, which its citizens are willing to cede control of due to the fact that they do not have money. It is a very calculated plan by the ROK and the Chinese. For the Chinese, it is opportunist; it's about securing access to the commodities and access to assets and investments. For the ROK, if DPRK collapses, they want control of energy, telecommunications and whatever that will reduce their overall (rebuilding) cost.

[Expert – Market researcher]

The political situation in DPRK could be precipitated by the sudden death of Kim Jong-il, which might result in a power struggle between different factions within the Workers Party. However, at this moment, DPRK's intention is to maintain regime survival while at the same time trying to 'play off' both China and ROK.

### **6.1.1 Analysis**

Chapter 2 introduced the political economy of DPRK stating that research into politics tends to focus on nuclear weapons and succession of Kim Jong-Il. The interviewees confirmed the view that nuclear issue is at the forefront of the dispute in the Korean Peninsula. In order for the country to move forward, the resolution of the nuclear issue is imperative. Several interviewees stated that no substantial foreign investment will enter the country unless DPRK is willing to abandon their nuclear arms. At the moment, DPRK uses the nuclear issue as leverage for more humanitarian aid and economic incentives (Elliott 2003).

Another political issue raised up by interviewees is DPRK's foreign relations especially with countries in the six-party talks – ROK, the USA, China, Japan and Russia. The roots can be traced back to the Korean War when the USA helped ROK while China aided DPRK (Koh 1971). Interviewees mentioned that each country have their own interests and stakes in DPRK. The USA and ROK

would prefer to have a nuclear-free Korean Peninsula while China wants to maintain its stronghold in the region (Shambaugh 2003). The different interests have cumulated in different scenarios for DPRK.

Interviewees raised up another point which might hasten the political change in DPRK – the death of Kim Jong-Il. Even though a successor has been named, however, the power struggle between different factions within the party might set off an internal war.

In view of these findings, the author proposes to develop scenarios of DPRK and examine their impacts on the transport and logistics development in DPRK in order to ascertain the transport and logistics strategies under each scenario.

## **6.2 Economics**

This section discusses the economic issues surrounding DPRK. Experts have commented earlier that politics and economics are correlated. In order to solve DPRK's economic woes, political issues need to be resolved. Several issues were highlighted under this broad topic – economic conditions, SEZs, farmers' markets, reunification costs, and investment.

As mentioned earlier in the literature review, any statistics on DPRK's economy is extremely difficult to obtain. Even though ROK publishes annual figures on DPRK, these are only based on estimates. Experts echoed similar sentiments on the lack of reliability of any data published.

Figures are famously difficult. One way that we'll know that they are really reforming is when we get a budget with numbers.

[Expert – UK]

Dire is the word. DPRK is such a unique (country) having achieved a second world status and then slid back to third world. DPRK remains structurally reliant on external supplies of food and energy.

[Government Official – UK]

Experts agreed that the July 2002 reform package provided a glimpse of the planning inside DPRK and the positive effects only lasted for a short period of time. The longer lasting effects were the introduction of younger managers, recognition of farmers' markets and the introduction of competition.

ROK has made much of the fact that the people (DPRK) they are dealing with are new and younger.

[Expert – UK]

There have always been farmers' markets. But that is pretty long way from a market economy. But on the other hand, you are finding newer approaches, taking a new interest in western/capitalist management techniques. There is an element of changes in a small way. More organisations are running like restaurants and taking account of what the customers want.

[Ex-government official – UK]

Experts agreed that the impact of SEZs in DPRK has been a mixed one with the main objective to earn hard currency for the State. Rajin-Sonbong and Sinuiju experiments were considered unsuccessful due to a lack of budget and investment from the government. Kungang-san and Kaesong Industrial Complex was an outflow of the 'Sunshine Policy' by Kim Dae Jung. According to one expert, it was likened to 'drip-feeding' DPRK's economy. The possibilities of other zones springing up have been discussed with various experts. Three of them mentioned two possible sites – Nampo (on the East) and Wonsan (on the West).



I think DPRK are interested in accessing technology. But hard currency is the bottom line in a lot of this. In Kaesong, the wages which are paid by ROK are a source of hard currency. I think as I said that the concept of zones is also a political one. It's not an economic one. For that reason, zones have been patchy in their success.

[Government official – UK]

Kaesong is an outpouring of the 'Sunshine Policy' and it is working for the ROK people. But it is only the ROK companies who can go in there. They repatriate all their money and their products. DPRK gets very little out of it. It gets no technology training.

[Expert – Market researcher]

Nampo is a port and they could get some investment in Wonsan as well. I know a lot of people would be interested in some of the mining around Wonsan. ROK are doing something about the coal mining there. They (NK) do not have a model on how to run an economic zone. They should go to Shenzhen, see how it's done, go back and do that.

[Expert – Academic]

The issue of rebuilding costs under different scenarios was discussed at length with the experts. All of them commented that, under any scenarios, ROK should be taking the lead in bearing most of the costs with help from international financial institutions. However, the interests of other actors will determine the role each plays. China is interested in developing the areas around Jilin and Heilongjiang and will have substantial interest in developing trade with DPRK. Some aid will arrive from Japan due to the historical links between both countries. Russia will be able to aid in some infrastructure projects.

### **6.2.1 Analysis**

The interviews revealed that experts viewed the political and economic issues as correlated. DPRK must resolve its political conundrums before dire economic conditions improve. Interviewees' comments on the reliability of any published

statistics echoed those in Chapter 2, where in its absence, more qualitative rather than quantitative research has been conducted.

Some interviewees commented that DPRK's experiments with SEZs have been rather unsuccessful, notably Sinuiju and Rajin-Sonbong (Young 1999 and Kim 2001). The purpose of creating SEZs is to earn hard currency and access technology. However its failure has been attributed to political and non-political factors. As mentioned in Chapter 2, political obstacles include leadership subjectivism, overindulgence in Juche ideology, insistence of economic self-reliance, and fear of economic domination by Japan and ROK (Kim 2001). Non-political impediments include inefficient transportation and telecommunications infrastructure and wrong location decisions. In view of these findings, the author proposes to ascertain the locations for future developments as special economic zones.

The last issue which the interviewees mentioned is the rebuilding costs under different scenarios. They commented that ROK should be the one taking the lead in undertaking most of the costs. This mirrors the strategy of ROK which has been stealthily supporting DPRK through humanitarian aid and opening of Kaesong Industrial Complex to alleviate the economic situation in preparation for any potential collapse or reunification (Smith 2005). Estrada and Park (2008) evaluated the prospects of unification from a multi-dimensional perspective encompassing the political, social, economic and technological dimensions. They found that it is likely to be a costly and disruptive process. Park (2001) raised the possibilities of international financial institutions like the WB or ADB to contribute to the rebuilding process. In summary, the author proposes to

ascertain the methods to finance future development projects in DPRK for developing scenarios in DPRK.

### **6.3 Infrastructure**

This section discusses the technical issues surrounding DPRK. Several issues were highlighted under this topic – cost of rebuilding infrastructure, main investment priorities, foreign technology, and business hub. The literature review has summarised the dire state of DPRK's transport and telecommunications infrastructure and in urgent need of rebuilding.

Experts were asked to comment on the parties responsible for rebuilding DPRK's infrastructure. They agreed that DPRK alone will not have the means of financing the reconstruction and it will not be left to a single country or organisation (e.g. World Bank) to provide financing as the costs will be too exorbitant. However, it also hinges on the geopolitics as countries such as ROK, China, Russia and Japan are all vying for influence in the Peninsula. One expert pointed out that for DPRK to obtain funding from international financial institutions, the nuclear issue must be resolved and the USA must remove its sanctions. While another suggested that private sector investors might be interested in some of the port and rail projects up North.

They [Russians] can do many things but they cannot pay for it. So I think Russia will be willing to help, particularly with some of the rail work.

[Ex-government official – UK]

It [rebuilding] could be multi-lateral for both economic and political reasons. Economic, because the task is so large. Politically, it depends on the type of scenarios. If it was a German-type scenario, some part of ROK would want to 'own' it, however on the other hand, no way could they afford it by themselves.

[Government official – UK]

Under the scenario of collapse and absorption by ROK, restructuring will be predominately led by the ROK, with some sector roles for Russia in energy and transport, and potentially for Japan, depending on whether ROK can manage their political relationship and for China also to develop the infrastructure links – expanding bridges, roads that would give access to mines, coal, iron and precious metals.

[Expert – Market researcher]

Depending on the results of efforts to resolve the nuclear crisis. If this is resolved satisfactorily and peacefully, and if the USA removes them from the list of states sponsoring terrorism, then they will be eligible for WB and ADB membership, from which they would have the chance to qualify for infrastructural investment.

[Expert – Academic]

Experts were asked about the main investment priorities for transport and logistics infrastructure. Experts differ on their opinions as some thinks that rail is crucial to mining resources, while others advocates for ports and roads to lead the economic revival.

I think for developing mining infrastructure, rail is the key. I think for DPRK to be self-sustaining, then getting infrastructure that will support mining exports in terms of rail linkages to the ports and for the individual ports to be developed cross border to China across the Amok river and new roads.

[Expert – Market researcher]

Rail is inflexible and expensive. It very much needs upgrading. I would have thought if you are going to have any sort of a move towards a market economy, you want people to be able to move around on their own terms. In normal countries, there are roads and buses and lorries travel.

[Expert – UK]

Nampo is important in its access to Pyongyang. It has a new container terminal. Rajin-Sonbong port up north around the Tumen River area has a lot of potential with transit traffic to and from China and Japan.

[Ex-government official – UK]

The experts were also asked for their opinions on the potential for DPRK to be a transit hub. The opinions were divided as some believed that it's not possible as it will face intense competition from the Northeast provinces such as Liaoning and Jilin which China aggressively wants to develop. Others believed that DPRK is the missing jigsaw in Northeast Asia. With a unified Korea and improving transport infrastructure in the region, there are plans for trains to travel from Busan in the South, cutting through to the east coast of DPRK all the way to Europe. Academics support the idea that it will reduce the transport costs and voyage times as compared to using sea transport.

### **6.3.1 Analysis**

The interviews revealed differing opinions with regards to the cost of rebuilding infrastructure, main investment priorities, foreign technology and DPRK as a business hub.

As mentioned in the previous section, the debate on the rebuilding costs under different scenarios covers the costs of rebuilding infrastructure. The main problem is estimating the cost of rebuilding railways and roads. Railways posed a greater problem as most of them are single-tracked which has not been upgraded after the 1970s. According to Kim et al. (2001), paved roads only account for 6.7% of the total length. Distribution in DPRK is hampered by the lack of these modern infrastructures. Kim (2001) suggested setting up a Northeast Asia Developmental Fund for the purposes of infrastructure building.

One expert suggested using the BOT (Build Operate Transfer) or BLT (Build Lease Transfer) model which is popular in transition economies, e.g. Vietnam. However, due to its autarkic nature, DPRK is not likely to be willing to adopt any foreign model except resembling China's or Russia's. The DPRK government can decide which infrastructure projects to distribute to according to their political relations.

The interviews revealed differing opinions on the investment priorities. Some believed that railways are important to connect the main arteries and it is the main form of transport in the country. Others view roads as more crucial due to the heavy investment costs in railways and the inaccessibility due to the geographical nature of the country. In 2007, the inter-Korean railroad plan was announced focusing on the Kyongui Line from Seoul to Sinuiju to serve Kaesong. The ROK government supports the construction of the TKR with supposedly savings of US\$520 per TEU when using Gyeongui Line over marine transport between Incheon and Nampo. Up north, since 2008, berths in Rajin-Sonbong SEZ have been leased to Chinese and Russian investors. Petrov (2008) reckons the investments are more politically motivated rather than economic sensibility which has led to both countries vying for territorial advantage close to their own borders. Oh (2001) suggested that the DPRK government should prepare for rapid motorisation by building expressway networks to support truck movements and intercity passenger travel. Therefore, the author proposes to establish transport infrastructure priorities for DPRK.

With regards to DPRK being a business hub in the Northeast Asia region, some experts feel that it will take many years before DPRK can achieve that while some believe that DPRK is the missing piece in the region. Much research has

been conducted into the cost savings when using rail transport from Busan, through the east coast of DPRK all the way to Europe in comparison with using water transport (Ahn 2002 and Kim et al 2002). The interview results revealed opinions which think that China would want to aggressively develop their northern region which includes Liaoning, Heilongjiang and Jilin provinces which will rival DPRK. One point which was raised up by the interviewees but found in the literature is the huge availability of raw materials such as gold, silver, iron ore, zinc, tungsten, magnetite and limestone which countries such as China, Japan and ROK have their sights on. China views DPRK as a viable mining as transport costs is less expensive in comparison to buying from Australia or Brazil. Kim (2007) estimated that DPRK's known mineral deposits to be nearly thirty times that of ROK as of 2005. DPRK has allowed foreign investors to participate in selected mining projects. Yoon (2011) provides a comprehensive summary of the types of mines and transport infrastructure. Therefore the author proposes to ascertain the types of industries in DPRK that will attract potential investors.

Chapter 3 introduced the the factors influencing the location choices of business enterprises. Earlier, we established that ROK enterprises will continue to be one of the largest investors in DPRK. Hence, the author proposes to determine the factors that influence the location choices of ROK SMEs and logistics companies to ascertain the transport and logistics strategies in DPRK.

#### **6.4 Managerial**

With the introduction of the Kaesong Economic Zone, ROK companies brought along with them technical expertise and managerial skills. Experts were asked

on the possibility of DPRK assuming managerial positions in the near future. Majority of the experts commented ROK companies were unlikely to relinquish control to DPRK as they feel that the local managers are not up to the job as they do not have any awareness of quality control or deadlines, which does not exist in DPRK at present.

One ex-government official commented that DPRK have sent people for overseas to study various disciplines. However, an expert commented that DPRK should not only focus on the technology but instead gain experience of dealing in joint ventures and businesses with foreign companies.

#### **6.4.1 Analysis**

The interviews reveal that the experts did not possess much knowledge of managers in DPRK except for those in Kaesong Industrial Complex. ROK managers are still the ones with the authority in the complex as local managers do not have any awareness of quality control or deadlines. This is in contrast with the literature where since 2002 July reforms, DPRK have made several changes to its economic management system with younger managers named in major enterprises; greater autonomy to make decisions; and introduction of courses to emphasise on financial and monetary economies (Lee and Deok 2004). In view of the observations, the author proposes to ascertain the managerial skills that DPRK managers should acquire.

#### **6.5 Spatial**

This section discussed about the main export markets for DPRK products. All of the experts commented that ROK is most likely the main market to absorb DPRK products as it is part of the potential reunification costs, followed by



China owing to its vast potential market and favourable bilateral ties. Another region which might import products would be Europe which has some ties with DPRK.

A wide variety of finished products have been suggested from ginseng to textiles and handicrafts. Some experts suggest that DPRK should concentrate on the light industries as a way to make use of its cheap labour and also as its neighbouring countries (China and Japan) progressively focuses on high-end manufacturing. DPRK has abundance of raw minerals (e.g. magnesium) which are coveted by many countries. However, due to poor transport infrastructure to the mines, it remains beneath the ground.

#### **6.5.1 Analysis**

Without a doubt, DPRK-made products would find it hard to find any buyers. ROK, as part of the reunification costs, has been mentioned by a majority of the experts while China, with more than one billion people, has a vast potential market and favourable bilateral ties. DPRK is still under the black list of the USA hence any DPRK made products would not be allowed into the country. Some countries in Europe, e.g. Switzerland and the Netherlands, have establish ties with DPRK and it is a potential market. Companies in Kaesong are involving in processing-on-commission where raw materials are being transported into Kaesong. The raw materials are being transformed into finished products to be sent back to ROK for export to other countries. In view of the findings, the author proposes to ascertain the main markets for DPRK -made products.

## **6.6 Social**

In this section, the experts were asked to comment, with the potential reunification, the main difficulties encountered when training and introducing new business concepts to DPRK and also the social difficulties of integrating both Koreas. Most experts commented that it will be difficult for DPRK to embrace new concepts as they have been embedded in their customary ways of conducting businesses. Similar to the German unification, even with the common language and history, it will take a long time to integrate the two Koreas.

### **6.6.1 Analysis**

The interviewees commented that cultural affinity will not be able to solve the problem of integrating both Koreas socially as both countries have their own methods of conducting business. It will take a long period of time to integrate both Koreas. Experts gave the example of the German unification scenario where differences still exist even though the country has been reunified for more than 20 years.

## **6.7 Legal and Organisational**

Two further themes, legal and organisational emerged after further analysis of the literature after the exploratory analysis.

Legal refers to the absence of formal institutions governing regulatory laws to safeguard the interests of foreign companies in DPRK. News reports that companies in Kaesong have avenues to redress the grievances when the complex was shut or when DPRK suddenly raised the wages of the employees

(Korea Times 2011). The rules surrounding foreign enterprises have not been changed since 1984. Personal contacts working in DPRK have mentioned that they are no clear rules governing contracts and it frequently changes.

Organisational refers to the logistics linkages and accessibility as well as logistics distribution system. Availability of logistics service providers at reasonable costs is important to companies seeking to invest in foreign countries (Dong 2001). As the level of investment in DPRK grows with more areas opening up, companies would require basic logistical services. Hence, the author proposes to ascertain the types of logistics services/concepts to be introduced in DPRK.

## **6.8 Summary**

This chapter presented and analysed the results of the exploratory studies. Eight themes were derived from the analysis linking them to the research questions. They will be investigated in the next stage of qualitative interviews and quantitative surveys to answer the research questions generated.

## **CHAPTER 7 – THE RESULTS OF THE QUALITATIVE RESEARCH**

This chapter presents the results of the qualitative research phase based on 38 electronic mail interviews. As already explained in Chapter 5, the qualitative data were analysed using a three-step approach. After analysing the results from the exploratory interviews, questions were added and deleted from the final copy which was sent to the experts who responded positively to the qualitative questionnaire. The presentation of the qualitative data includes some direct quotes from the interviewees in order to support views and to illustrate the results. The quotations are stated anonymously, but with a specific reference to the group of interviewees. The results of the exploratory study supported the development of the qualitative research.

### **7.1 Politics**

#### **What are the main political issues currently surrounding DPRK?**

Collectively, the experts think that, from the standpoint of the international community, the threat of nuclear weapons is the main issue which needs to be resolved. DPRK is concerned about its survival and thus using the nuclear threat would prevent an invasion from ROK and the USA as well as acquiring more economic concessions from different stakeholders.

Other issues mentioned by experts including the economic problems in DPRK which has been well documented in the literature that the situation inside the country is dire and many citizens are facing starvation. DPRK often relies on humanitarian aid from China and ROK. The economy is not able to sustain itself due several reasons: dilapidated transport infrastructure which affects

distribution system; flooded mines; lack of raw materials; poor efficiency and no markets for DPRK -made products.

The succession issue was mentioned by several experts. The death of Kim Jong-il might lead to in fighting between different factions in the party – those supporting the eldest or youngest son.

The paragraphs below gives more detailed insights into the interests of different stakeholders in DPRK.

**What are the interests/strategies of the respective countries towards DPRK? (i.e. USA, China, ROK, Japan and Russia)**

The experts agree that the interest of the USA is three fold: (i) nuclear proliferation (ii) eventual reunification on ROK terms (iii) containing China's influence on DPRK.

Containing nuclear proliferation; stability in the region; containing Chinese approach to NK.

[Expert – Academic, USA]

The USA is interested primarily in eliminating DPRKs ability to threaten the USA with nuclear weapons and missiles, and, secondarily, in ensuring that when unification eventually occurs, it will take place largely on ROK terms. Current USA policy is incoherent.

[Expert – Academic, ROK]

The experts agree that China do not wish for DPRK to collapse and to maintain status quo in the region. They are concerned with the sudden influx of migrants into its neighbouring regions should a collapse occur as well as the expanding influence of the USA into DPRK.

China is interested primarily in stability on the Korean Peninsula to allow [themselves] to continue to develop economically. China does not wish to risk the expansion of USA influence into the northern half of the Korean Peninsula.

[Expert – Academic, USA]

I think that China's main goal in relation to DPRK is to prevent instability and collapse there and to prevent reunification with the South. China enjoys a communist buffer, I believe.

[Expert – Academic, USA]

The consensus is that ROK is in huge dilemma on how to engage DPRK with divided views with the country. ROK wants to maintain stability in the Peninsula while trying to maximise its influence in the event of unification.

ROK is very divided and confused at the moment regarding DPRK. In the long run, ROK's interest lies in maintaining peace and stability on the peninsula while maximizing the ROK's influence in the event of unification.

[Expert – Institute Researcher, USA]

ROK wants to develop DPRK in order to lower the price of eventual reunification.

[Expert – Journalist, USA]

ROK wants "slow-motion" reunification (since it believes that it can't afford sudden reunification).

[Expert – Researcher, USA]

Japan's policy on DPRK resembles the USA, containing nuclear proliferation.

The abduction issue is also foremost on the minds of the government. At the same time, they want to contain China's influence on the region.

Japan's policy is incoherent and generally follows the USA, but the establishment's real, long-term focus is less on DPRK than on China.

[Expert – Academic, USA]

Japan is worried about rising China, therefore wants to rearm, and therefore finds DPRK's actions a convenient excuse. It also wants to prevent reunification, afraid that a unified Korea would side with China and present both strategic and economic problems.

[Expert – Academic, ROK]

Russia's standpoint is similar to China – to maintain stability in the Korean Peninsula and to steadily increase its influence for its own economic benefits, especially using TSR to link to European markets.

Russia, like China, wants regional stability so that it can pursue its own economic growth in the Russian Far East.

[Expert – Academic, USA]

Russia does not want any of the other great powers to increase its influence on the Korean Peninsula. Its current engagement of DPRK is designed with this in mind.

[Expert – Academic, USA]

Russia would like more influence in DPRK as an economic bridge between Japan/ROK and the TSR to European markets.

[Expert – Researcher, ROK]

**Several scenarios of DPRK have been suggested: (1) regime collapse from military coup (2) regime collapse from uprising of citizens (3) integration and peaceful unification and (4) status quo. Which scenario do you think is most likely to take place in the next 5-7 years?**

A majority of the experts viewed that status quo is the most plausible scenario for the next five to seven years with various views given for this assertion. The trump card in any eventual changes is the issue of succession of Kim Jong-il.

Status quo is most likely. There are no indications of a likely military coup and certainly not of a citizen uprising, given the great suppression of the people. No outside power is seeking military conflict. Integration and peaceful unification are very remote, as DPRK is not willing to deal with ROK because the latter has outperformed the North in every area except nuclear weapons and missiles (and that only because the South did not pursue those because of USA pressures).

[Expert – Academic, USA]

Status quo and possibly cautious economic reforms; only this option would be in the interest of the DPRK elite. Authorities are still strong enough to maintain power.

[Expert – Industry, China]

I feel that 5 [Status quo] is most likely. Regime collapse through military coup seems unlikely because the military is at present benefiting from the regime, as officers essentially run “businesses” in ways that others cannot. Regime collapse via uprising is highly unlikely as long as such a strict hold on information is maintained by the government. Unification through military conflict is unlikely because Seoul (the city) would be so much at risk in any conflict, thus SK would not start a war, and will go to great lengths to prevent one. Integration and peaceful unification is, I think, likely, but not in the 5 to 7 year time frame—there are too many issues to be dealt with before that can happen.

[Expert – Researcher, UK]

**In your opinion, on a scale of one (very unlikely) to 5 (very likely), do you think that there will be a unified Korea within the next 30 years? If yes, how do you think the process of unification will take place?**

Experts were divided in their opinions on the likelihood of a unified Korea within the next 30 years. Sixty per cent of the experts think that it is very likely while the rest only think it is likely.

5 (very likely). Eventually, DPRK’s economic reforms will generate a new economic class that will demand representation. Once there is a measure of political change in the North, both North and South will enter into discussions about a staged process of reunification.

[Expert – Researcher, USA]

I think a unified Korea is very likely, but it may take most of 30 years to come about. Investment in DPRK by ROK, plus humanitarian assistance, social exchange, and gradual replacement/refurbishment of DPRK infrastructure, will gradually spur economic integration. Political reunification may only come upon the death of Kim Jong-Il, if he does not leave a strong heir.

[Expert – Academic, USA]

I would have to take the middle ground, at number 3. Four conditions would have to be met: 1) death of Kim Jong Il; 2) regional security mechanism in place involving the 6 parties; 3) sufficient economic development in ROK to prevent economic collapse of DPRK; 4) agreement between China and the USA on the status of a unified Korea.

[Expert – Industry]



4. I would have chosen a lower number except for what happened in Germany. In 1960, reunification seemed most unlikely in anyone's lifetime, but it did happen within 30 years. I believe that, first, DPRK needs to reform. On this front, I think the most viable path is the one that China and Vietnam are taking: economic reform using SEZs, while maintaining a communist state. This, I think, would lead to political opening which would make reunification possible. It's quite possible, again, that none of this happens in our lifetime; on the other hand, change could happen quite quickly.

[Expert – Academic, ROK]

## **7.2 Economics**

**In a status quo scenario, what sort of economic aid/incentives can DPRK expect from various countries (i.e. USA, China, ROK, Japan and Russia)?**

In this scenario, DPRK is likely to face continued sanctions from the USA and Japan. The only countries who will contribute are China and ROK; both want to preserve stability in the region. China is likely to provide food, oil and energy while ROK will provide investment and humanitarian aid. Russia, to a lesser extent, will provide some energy.

No USA administration is likely to provide much aid, if any, to DPRK as long as it maintains nuclear weapons. China will continue to provide life support but little more. ROK will likely scale back aid as the years pass, especially if a conservative wins the next presidency. Japan will probably provide no aid for the foreseeable future. Russia may provide assistance, but it will be very minimal.

[Expert – Academic, ROK]

**In a regime collapse scenario, what are the main economic priorities for DPRK in the short, medium and long term?**

Experts agree that in the short term, the most important need is to ensure that humanitarian aid is provided and to ensure internal stability. The next priority in the medium term is to begin economic reforms and to re-build infrastructure and agriculture. During this period, it should be agreed among regional powers on who should run DPRK. In the long term, experts reckon that it is important to make DPRK feel equal to ROK, economically and politically. At the same time,

special economic districts/zones should be identified to attract foreign investment.

Short: humanitarian assistance (food, basic medicines, shelter).  
Medium: employment. Long term: making DPRK feel equal to ROK, economically and politically.

[Expert – Academic, USA]

Short: eat and not to get killed by sickness or internal chaos. Mid: get along with regional powers. Long: get along with ROK and merge into one nation Short: sometimes economic incentives, sometimes strong sanction needed. Medium: Requiring very strong transparent process for economic incentives is mandatory. Long: Two Korean parties develop certain business district/city such as Kaesong.

[Expert – Journalist, USA]

**In a peaceful reunification scenario, what are the economic strategies needed to help DPRK?**

Experts have a variety of views on the type of economic strategies needed to help DPRK in the event of a peaceful reunification. The consensus is that the South should not help the North without laying down terms and conditions.

Governance-oriented gradual transition and integration strategy which is in the interest of all stakeholders incl. the interests of the DPRK elite and leadership (incl. military).

[Expert – Academic, USA]

The best (though not in an economic theory sense “optimal”) strategy is a fast take-over by ROK, since ROK offers much more skills than DPRK ever can have. an important decision is the question, how to prevent mass migration (e.g. by holding low labour costs in the DPRK region and offering massive regional/ structural investment in the North).

[Expert – Academic, USA]

Don't give free goods: fertilizers and rice are strategic goods: when you give, request reciprocity. Only give humanitarian aid: disposable food (not rice) and medicine. Use market economic principle vigorously: work hard and earn hard.

[Expert – Academic, ROK]

Capacity building to prepare leaders and technicians for life after integration, technology transfer and creation of employment opportunities in DPRK, assistance with planning and creating markets and market regulation, as well as redeveloping infrastructure with a long-term focus.

[Expert – Industry]

**What are the potential sources of financing for economic development projects in DPRK?**

Experts gave a variety of opinions regarding the potential financial sources for future economic development projects in DPRK depending on different scenarios. Under the status quo scenario with the nuclear issue unresolved, economic projects will be limited. The USA and international financial institutions (IFIs) would not be able to offer any financial help. Only ROK or China would be willing to offer economic incentives in exchange for stability or entry into DPRK. Under the collapse scenario, IFIs and the USA will begin to contribute to the economic projects while other countries such as Japan, Russia and some European countries will be interested in mines around the country. Under the reunification scenario, ROK will take the lead in rebuilding the country with help from IFIs and other countries.

In a status quo scenario, unless the nuclear issue makes any progress, otherwise no major economic projects will be successful. The USA will continue with the economic sanctions.

[Expert – Academic, USA]

ROK and China will continue to be the main players under the status quo scenario. China is focusing on the Rajin-Sonbong Development Zone to create a transit for its goods to move to Japan.

[Expert – Industry]

If DPRK collapses through a military coup or citizen uprising, financial institutions like the WB will begin to contribute to the rebuilding process. The USA will contribute some money as well.

[Expert – Journalist, USA]

If reunification does take place, we can look towards ROK to play a major role. They have been preparing for reunification ever since Kim Dae Jung came up with the Sunshine Policy to pay millions of dollars each year to DPRK for the use of Kungang-san and Kaesong.

[Expert – Academic, ROK]

### **7.3 Infrastructure**

#### **In a status quo, regime or peaceful reunification scenario, who would finance the cost of rebuilding DPRK's infrastructure?**

Experts think that public investment, if any, would be small with investment coming from China and ROK. Some experts think there will be some private investment.

In a status quo scenario, by definition only modest rebuilding of infrastructure would occur, financed by a combination of DPRK public sources, some DPRK private sources, ROK investments, and, perhaps mostly, investment from Chinese firms.

[Expert – Defector, DPRK]

To a small extent ROK and China, mostly there will be no rebuilding, but further decay.

[Expert – Report, ROK]

#### **In a regime collapse scenario, who would finance the cost of rebuilding DPRK's infrastructure? (public, private)**

In this scenario, experts agree that both public and private sector will play an important role in rebuilding DPRK's infrastructure. If unification is on ROK's terms, then majority of the funding will come from a combination of public and private funds. China will also be interested to provide funding to ensure that its position in DPRK is maintained. International financial institutions like the WB and the ADB will also contribute some funding.

Assuming unification follows on ROK terms, the largest source would be ROK, a combination of public and private funds. Most of the rest would be private FDI, with some IFI support.

[Expert – Academic, ROK]

Combination of sources, led by the ROK public sector, WB/IBRD/ADB, Japanese reparation funds, private investments from the USA, EU, Japan, China.

[Expert – Academic, USA]

**In a peaceful unification scenario, who would finance the cost of rebuilding DPRK's infrastructure? (public, private)**

Experts all agree that ROK will be taking the lead in this scenario with international financial institutions providing support.

ROK (or, better: unified Korea) plus IFI plus foreign investors, as far as they are allowed to participate in the process.

[Expert – Industry]

International organizations and ROK government; partly private sector.

[Expert – Academic, USA]

**Please rank, from one (highest priority) to seven (lowest priority), the main investment priorities for transport logistics infrastructure in DPRK?**

Forty-four per cent of the experts regarded road access as the top investment priority in DPRK. Thirty-four per cent of the experts placed rail access as the second priority while access to maritime ports was viewed as the third priority by 31.5 per cent of the experts. Access to airports was regarded as the last priority by the experts.

#### **7.4 Managerial**

**What are the three main areas/disciplines which DPRK can send their delegates overseas to gain essential knowledge?**

Experts suggested a variety of disciplines and areas, such as economics, finance, law, commercial practices, and engineering, which DPRK managers can acquire further skills. A majority of the experts suggested the area of economics and finance where managers can learn the principles of market economy and management of foreign direct investments. Experts commented that DPRK has been learning from many different countries, including China, Singapore and Vietnam, in terms of FTZs. Experts believe that managers need to acquire skills in understanding the global financial system to aid in currency exchange controls and improve its own banking system. Commercial practice is another area which has been highlighted by the experts. International trade skills such as business law and customs will become more important gradually when DPRK increases its trades with foreign countries.

Engineering is another area as DPRK would require managers with civil engineering knowledge in view of rebuilding of infrastructure and mining sites, especially railway tracks and gravel roads. Information technology was mentioned several times by experts. They think that DPRK can specialise in this area to take advantage of the internet and communications infrastructure.

## **7.5 Spatial**

### **Where are the main markets for DPRK-made products?**

All experts listed China, ROK, Japan and Russia as the main export markets for DPRK-made products. A few experts mentioned European countries and Singapore as possible locations.

ROK (light manufacturing), China (raw materials), Japan (seafood, agriculture).

[Expert – Researcher, USA]

The raw materials and marine products below find markets worldwide, but particularly in China, Japan, and ROK. DPRK manufactured products, with the exception of those from factories recently set up for export, have few markets in other countries, and are being displaced domestically by products from China.

[Expert – Industry]

### **What are the main DPRK products suitable for export?**

Experts suggested some core products which DPRK can export. These include: minerals (iron ore, gold, and manganese), marine products (fishery), agricultural and light industry (produced in Kaesong Industrial Complex). Some experts urged the development of assembly industry to enable it to participate in the global supply chain.

DPRK has to build up a viable light industry/ assembly industry for export as part of a supply chain.

[Expert – Industry]

Minerals, agricultural specialties (e.g. mushrooms), low-tech manufactured goods.

[Expert – Researcher, ROK]

## **7.6 Summary**

This chapter presented the findings of the qualitative interviews with experts. The interpretation and analysis will be discussed in Chapter 9 together with the quantitative survey. The next chapter presents the findings of the quantitative survey with ROK SMEs and logistics companies.

## **CHAPTER 8 – THE RESULTS OF THE QUANTITATIVE RESEARCH**

This chapter presents the findings of the quantitative research phase. The data analysis process was carried out in various steps. First, the data was transferred from the questionnaire to SPSS (version 16), the computer software package used for the data analysis. Saunders et al. (2009), emphasise the importance of data coding in the process while Diamantopoulous and Schlegelmilch (1997) point out that coding should be carried out thoroughly, as mistakes made at this stage are difficult to correct later. After the initial data have been entered, questionnaires were double checked to ensure no errors.

### **8.1 Characteristics of Respondents**

This section provides an overview of the characteristics of the ROK SMEs and logistics companies which took part in the questionnaires. Some 503 and 250 questionnaires were sent out to SMEs and logistics companies respectively. A total of 130 completed questionnaires, comprising of 80 from SMEs and 50 from logistics companies, were returned with the response rate at 16% and 20% respectively.

Table 8.1 and 8.2 presents the experience of managers in their own industry and current organisation. Sixty-eight per cent of the SMEs managers and 76% of the logistics managers have more than six years of managerial experience in their own respective industries while 66% of the SME managers and 76% of the logistics managers have been at their current organisation for more than six years. It is reasonable to assume that the answers are given by managers with vast experience and knowledge of their industry and organisation.



<b>Experience in Industry</b>	<b>Valid Responses (SMEs)</b>	<b>Percentage of Valid Responses</b>	<b>Valid Responses (Logistics)</b>	<b>Percentage of Valid Responses</b>
Less than 1 year	4	5.00%	0	0.00%
1-3 years	10	12.50%	1	2.00%
4-5 years	11	13.75%	11	22.00%
6-10 years	17	21.25%	20	40.00%
More than 10 years	38	47.50%	18	36.00%
<b>Total</b>	<b>80</b>	<b>100.00%</b>	<b>50</b>	<b>100.00%</b>

**Table 8.1: Experience of managers in industry**

<b>Experience in Organisation</b>	<b>Valid Responses (SMEs)</b>	<b>Percentage of Valid Responses</b>	<b>Valid Responses (Logistics)</b>	<b>Percentage of Valid Responses</b>
Less than 1 year	7	8.75%	0	0.00%
1-3 years	11	13.75%	1	2.00%
4-5 years	9	11.25%	11	22.00%
6-10 years	18	22.50%	20	40.00%
More than 10 years	35	43.75%	18	36.00%
<b>Total</b>	<b>80</b>	<b>100.00%</b>	<b>50</b>	<b>100.00%</b>

**Table 8.2: Experience of managers in current company**

Regarding the number of employees in each organisation, Table 8.3 shows that 53.8% of the SMEs and 88% of the logistics companies has less than 100 employees in their organisations.

<b>Number of Employees</b>	<b>Valid Responses (SMEs)</b>	<b>Percentage of Valid Responses</b>	<b>Valid Responses (Logistics)</b>	<b>Percentage of Valid Responses</b>
1-19	6	7.50%	8	16.00%
20-49	20	25.00%	16	32.00%
50-99	17	21.25%	20	40.00%
100-199	19	23.75%	5	10.00%
200-299	17	21.25%	1	2.00%
>300	1	1.25%	0	0.00%
<b>Total</b>	<b>80</b>	<b>100.00%</b>	<b>50</b>	<b>100%</b>

**Table 8.3: Number of employees in SMEs and logistics companies**

Table 8.4 shows that 77.5% of the SMEs and 70% of the logistics companies record revenues below US\$9 million while only 5% and 6% of the respective SMEs and logistics companies earn more than US\$20 million annually.

<b>Total revenue (USD)</b>	<b>Valid Responses (SMEs)</b>	<b>Percentage of Valid Responses</b>	<b>Valid Responses (Logistics)</b>	<b>Percentage of Valid Responses</b>
<\$5m	24	30.00%	21	42.00%
\$5-9m	38	47.50%	14	28.00%
\$10-19m	13	16.25%	9	18.00%
\$20-39m	4	5.00%	6	12.00%
>\$40m	1	1.25%	0	0.00%
<b>Total</b>	<b>80</b>	<b>100.00%</b>	<b>50</b>	<b>100.00%</b>

**Table 8.4: Total annual revenue of SMEs and logistics companies**

Table 8.5 presents an overview of the types of industries from the SMEs questionnaire. At present, ROK SMEs form the majority of the companies investing in the Kaesong Industrial Complex and other parts of DPRK. The sample was created from those SMEs who have expressed an interest in investing in DPRK. The main reason being they are more likely to invest in DPRK and their decision/opinions will have an effect on the policies surrounding DPRK.

Electronics and textile industries form a majority of the enterprises who responded. Out of a total of 90 enterprises contacted, 32 companies from the electronics industry and 19 companies from the textile industry responded.

<b>Types of industries</b>	<b>Valid Responses</b>	<b>Percentage of Valid Responses</b>	<b>Number of Enterprises Contacted</b>
Electronics	32	40.00%	90
Textile	19	23.75%	90
Minerals/Ore	8	10.00%	20
Food Processing	5	6.25%	30
Machinery	4	5.00%	28
Basic Metals	3	3.75%	25
Petroleum/Chemical	2	2.50%	25
Non-Metal Products	2	2.50%	20
I.T. service	2	2.50%	23
I.T.	1	1.25%	25
Transportation Equipment	1	1.25%	18
Agricultural	1	1.25%	25
Paper/Pulp	0	0%	27
Hotel	0	0%	10
Leisure (tourism/golf)	0	0%	24
Finance	0	0%	20
<b>Total</b>	<b>80</b>	<b>15.9%</b>	<b>503</b>

**Table 8.5: Types of SMEs' industries**

SMEs were asked to select three types of industries and their size of investment in DPRK. Mineral/ore and electronic industries accounted for 38.5% of the choices of the SMEs, with basic metals and textile industries accounting for further 14% and 10.8% respectively. Some 22.5% of the respondents would only invest less than US\$1 million while 57.5% would invest between US\$1-9 million dollars. This implies that the initial investment would be relatively low with major investment in minerals/ore and electronics industry. Table 8.6 presents an overview of the type of industries for potential investment in DPRK while Table 8.7 presents the size of potential investment in DPRK.

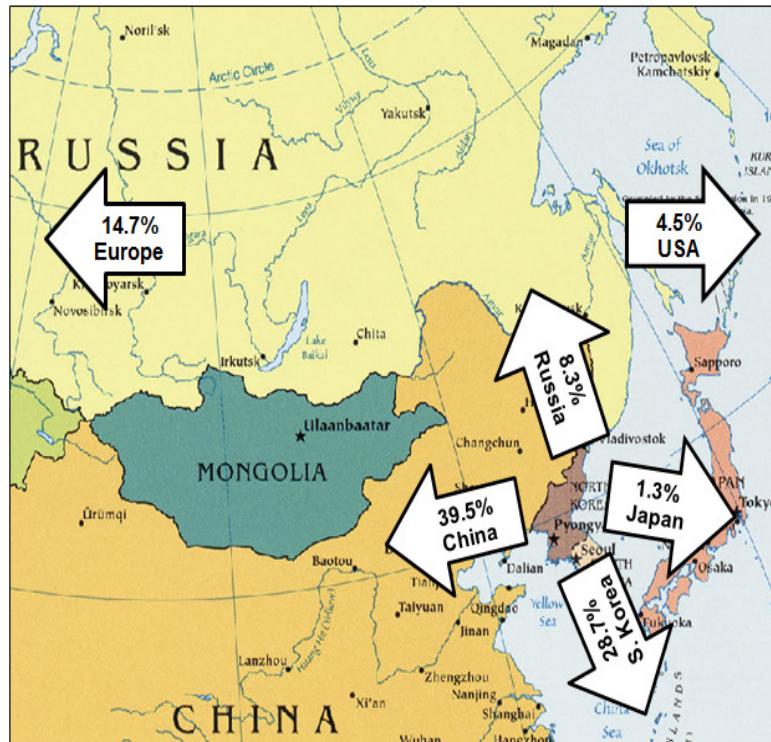
<b>Industries for Potential Investment</b>	<b>Count</b>	<b>Percentage</b>
Minerals/Ore	37	20.11%
Electronics	34	18.48%
Basic Metals	26	14.13%
Textile	20	10.87%
I.T.	15	8.15%
Machinery	14	7.61%
Transportation Equipment	11	5.98%
I.T. service	7	3.80%
Food Processing	6	3.26%
Agricultural	6	3.26%
Non-Metal Products	5	2.72%
Petroleum/Chemical	2	1.09%
Paper/Pulp	1	0.54%
Hotel	0	0.00%
Leisure (tourism/golf)	0	0.00%
Finance	0	0.00%
<b>Total</b>	<b>184</b>	<b>100.00%</b>

**Table 8.6: Type of industries to be invested in DPRK**

<b>Size of investment (USD)</b>	<b>Valid Responses</b>	<b>Percentage of Valid Responses</b>
<\$1m	18	22.50%
\$1-9m	46	57.50%
\$10-99m	15	18.75%
\$100-499m	1	1.25%
<b>Total</b>	<b>80</b>	<b>100%</b>

**Table 8.7: Size of potential investment in DPRK**

Regarding the export destinations for DPRK made products, SMEs were asked to choose two potential markets. 39.5% and 28.7% of the respondents chose China and ROK respectively. This reflects the size of the export markets and geographical proximity of the destinations due to the decrepit infrastructure in DPRK. Regarding the transport arrangements, a high concentration of modal flow would be focused on road and water transport with 53.8% and 37.5% respectively. Figure 8.1 shows the potential export markets for DPRK made products and Table 8.8 presents the main modes of transportation used when exporting goods out of DPRK.



**Figure 8.1: Potential Export Markets for DPRK-made Products**

Mode of transport	Valid Responses	Percentage of Valid Responses
Water	30	37.50%
Rail	7	8.75%
Road	43	53.75%
Air	0	0.00%
<b>Total</b>	<b>80</b>	<b>100.00%</b>

**Table 8.8: Mode of transport when exporting out of DPRK**

Regarding the potential locations of future investment in DPRK, 37.5% of the respondents picked Nampo as the top location while 32.6% picked Sinuiju, which is located close to the Chinese border. Figure 8.2 shows the potential locations for future investment.



**Figure 8.2: Potential investment locations in DPRK**

Regarding the logistics companies, 68% have more than 11 years of experience in the logistics industry. A majority of the logistics services provided concentrates on freight forwarding (24.2%), warehousing (19.5%), consulting services (14.1%) and customs clearance (13.3%) Table 8.9 and 8.10 provides an overview.

No. of Years in Logistics Industry	Valid Responses	Percentage of Valid Responses
5 or less	7	14.00%
6-10	9	18.00%
11-15	14	28.00%
16-20	14	28.00%
Over 20	6	12.00%
<b>Total</b>	<b>50</b>	<b>100%</b>

**Table 8.9: Organisation's experience in logistics industry**

<b>Types of Logistics Services Provided</b>	<b>Count</b>	<b>Percentage</b>
Freight Forwarding	31	24.22%
Warehousing	25	19.53%
Consulting Services	18	14.06%
Customs Clearance	17	13.28%
Transport	15	11.72%
Customer Service	8	6.25%
Freight Consolidation	6	4.69%
Packing/Storage	3	2.34%
Physical Distribution	2	1.56%
Multi-modal	2	1.56%
Break-Bulk Operations	1	0.78%
Freight Brokerage	0	0.00%
Reverse Logistics	0	0.00%
Purchasing	0	0.00%
Order Processing	0	0.00%
<b>Total</b>	<b>128</b>	<b>100.00%</b>

**Table 8.10: Type of logistics services provided**

<b>Industries Served</b>	<b>Count</b>	<b>Percentage</b>
Electronics	21	25.61%
Textile	13	15.85%
Machinery	13	15.85%
Transport Equipment	9	10.98%
Food Processing	8	9.76%
I.T.	6	7.32%
Agricultural	5	6.10%
Petroleum/Chemical	3	3.66%
Non-metal products	3	3.66%
Minerals/Ore	1	1.22%
Paper/Pulp	0	0.00%
Basic metals	0	0.00%
Hotel	0	0.00%
I.T. service	0	0.00%
Leisure (tourism/golf)	0	0.00%
Finance	0	0.00%
<b>Total</b>	<b>82</b>	<b>100.00%</b>

**Table 8.11 Types of industries served**

Regarding the types of industries served, 21 logistics companies indicate that they serve the electronics sector while 13 companies serve the textile and

machinery industries. Other industries include transport equipment and food processing. Table 8.11 shows the types of industries served.

Logistics companies were asked about their previous/current logistics operations in DPRK the places served and the volumes transported. Whilst 38 companies indicated that they had no historical operations in DPRK, 12 companies provided prior logistics services with Nampo as the top destination and only less than 5,000 tonnes of cargo were transported. Table 8.12-14 provides an overview.

<b>Logistics Operations in DPRK</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	0	0.00%
Previously	12	24.00%
No	38	76.00%
<b>Total</b>	<b>50</b>	<b>100.00%</b>

**Table 8.12: Logistics operations in DPRK**

<b>Operations in DPRK</b>	<b>Frequency</b>	<b>Percentage</b>
Nampo	8	16.00%
Najin-Sonbong	2	4.00%
Pyongyang	1	2.00%
Sinuiju	1	2.00%
Wonsan	0	0.00%
Cheongjin	0	0.00%
Haeju	0	0.00%
<b>Total</b>	<b>12</b>	<b>100.00%</b>

**Table 8.13: Locations served in DPRK**

<b>Volume Transported</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 5000 tonnes	12	100.00%
5000-10,000 tonnes	0	0.00%
10,000-20,000 tonnes	0	0.00%
20,000-40,000 tonnes	0	0.00%
40,000-60,000 tonnes	0	0.00%
More than 60,000 tonnes	0	0.00%
<b>Total</b>	<b>12</b>	<b>100.00%</b>

**Table 8.14: Total volume transported annually**



## 8.2 Further Findings

Appendix IX shows the size of SMEs corresponding to the size and locations of investment. SMEs have been divided into small and large based on the number of employees in the companies. Small SMEs (43) have been reclassified with employees of less than 100 while large SMEs (37) are those with more than 100 employees. The top two potential locations for investment are Nampo and Sinuiju. Nampo can potentially attract a total of 30 SMEs' investment up to US\$499 million dollars while 16 SMEs have indicated Sinuiju, with its close proximity to the North-East region of China, as a place of investment with majority of investment ranging US\$1-9 million dollars. Large SMEs have indicated a willingness to invest ranging US\$10-99 million dollars while a majority of the smaller SMEs' are willing to invest up to US\$9 million dollars. The Mann-Whitney U Test shows that large companies (mean rank = 50.70) will make a significantly higher difference than small companies (mean rank = 31.72) in terms of size of investment. The Kolmogorov-Smirnov Z-test (2-tailed - 0.036) confirms the above findings. The Mann-Whitney Test shows that there is no significance difference between both groups (large group, mean rank = 40.31, small group, mean rank = 40.66) regarding the investment locations. The Kolmogorov-Smirnov Z-test (2-tailed - 0.977) confirms the above findings.

Appendix X presents the size of investment of industries in potential locations in DPRK. The electronics and minerals industry will most likely be spearheading the investment flow in Nampo with 56 SMEs signifying investment ranging US\$1-99 million dollars. Seven SMEs from the electronics industry will be willing to invest US\$10-99 million dollars while ten SMEs have indicated an interest to invest US\$1-9 million dollars in the minerals industry. In Sinuiju, the

majority of investment is also expected to come from the electronics and minerals industry with a total of 53 SMEs have indicated their willingness to invest with a majority investing up to US\$9 million dollars in the city. The Mann-Whitney U Test shows that SMEs with investment less than US\$10 million dollars (mean rank = 44.16) will make significant difference compared to companies with investment of more than US\$10 million dollars (mean rank = 25.88). The Kolmogorov-Smirnov Z-test (2-tailed - 0.03) confirms the above findings that SMEs with smaller investment will have greater importance in the development of transport strategies in DPRK.

Table 8.15 presents the mode of transport used when transporting goods out of DPRK with water and road transport as the main transport modes. In Nampo, 15 SMEs each indicate water and road transport as their preferred mode. In Pyongyang, Wonsan and Sinuiju, road transport is the preferred mode of transport to be used while water transport is preferred in Najin-Sonbong.

<b>Mode of transport</b>	<b>Future investment</b>					<b>Total</b>
	<b>Nampo</b>	<b>Pyongyang</b>	<b>Wonsan</b>	<b>Sinuiju</b>	<b>Najin-Sonbong</b>	
Water	15	2	1	8	4	<b>30</b>
Rail	0	2	0	4	1	<b>7</b>
Road	15	8	3	14	3	<b>43</b>
<b>Total</b>	<b>30</b>	<b>12</b>	<b>4</b>	<b>26</b>	<b>8</b>	<b>80</b>

**Table 8.15: Mode of transport when transporting goods out of DPRK**

Appendix XI shows SMEs' size of investment and industries to invest in locations around DPRK corresponding to the mode of transport used when export to potential markets. China and ROK forms the major export destination for DPRK -made products. For export markets in China, majority of the investment by SMEs in the minerals/ore industry will use road transport from

Nampo to China, with likely routes through Sinuiju as it is the closest border. Goods from textile industry from Nampo to China concentrates on using water transport while road transport is the main mode when transport out of Sinuiju. It is important to develop road infrastructure from Nampo to Sinuiju. Export markets in ROK attract investment from textile, electronics and minerals industry. From Nampo, majority of the textile products is through water transport. From Sinuiju, road transport is the preferred mode. For electronics products, road is the preferred mode from Nampo while SMEs indicate the use of all three main transport modes when exporting out of Sinuiju to ROK. For the minerals industry, road transport is the preferred mode when exporting out of Nampo and Sinuiju.

Appendix XII shows the types of services provided by logistics companies across the top eight industries. The top four logistics services, which make up 64.7% of the total services provided, are freight forwarding, warehousing, consulting services and transport. Freight forwarding (22.0%) and warehousing (18.4%) are the most frequent services provided, with concentration in the machinery and electronics industries. Next, consulting services (12.8%) mainly focuses on the textile and electronics industries while the machinery industry requires a majority of the transport services (3.2%).

Appendix XIII shows the scope of logistics companies' operations in DPRK presenting the types of logistics services required by different industries in DPRK cities, mainly Nampo, Sinuiju and Rajin-Sonbong. Freight forwarding and warehousing are the top logistics services employed in various industries in DPRK. Customs clearance, consulting services, customer service, freight consolidation and transport are the other services used.

### **8.3 Factors Influencing Location Decisions in DPRK**

This section presents the findings relating to the factors influencing SMEs' and logistics companies' decision to locate investment and/or services in DPRK. SMEs and logistics companies were provided with a list of eight potential areas with a total of 58 factors. The list was generated in the light of the findings of the exploratory study and previous studies by MacCarthy and Atthirawong (2003), Oum and Park (2004), and Bhatnagar and Sohal (2005) investigating factors determining location decisions. This section also presents the findings resulting from the analysis of the descriptive statistics. One main statistical method was chosen to analyse the data. A principal component analysis (also known as "factor analysis") was carried out to reduce the data and identify underlying dimensions of the variables in question.

#### **8.3.1 Analysis of the Descriptive Statistics**

Before starting the initial data analysis, it is widely recommended to check for violations of statistical conventions. SPSS generated-frequencies were used in order to identify any omission errors and to confirm sample validity. Thus the number of valid cases and maximum and minimum values were checked for errors. All values of the continuous variables fell within the possible minimum and maximum range. Thus the sample validity of 130 cases was confirmed. Following suggestions by Pallant (2005) and Field (2005), various statistical tests were carried out in order to test for the distribution of the values and to detect any outliers. The results of the tests and their interpretation can be found in Appendix XIV. The following paragraphs describe the tests and the interpretations of their outcomes.

- Comparisons between the mean and 5%-trimmed mean were carried out in order to assess the influence of outlying values. The trimmed mean calculates the mean for data between the 5<sup>th</sup> and 95<sup>th</sup> percentiles. A significant difference indicates that there are some outliers and manipulation of the data set might have to be considered.
- The measure of skewness provides an indication of the symmetry of the distribution. A skewed distribution can be either negatively skewed (scores clustering towards high values) or positively skewed (tail points towards higher and more positive scores).
- Kurtosis describes the 'peakedness' or 'flatness' of the distribution. In a normal distribution the value of kurtosis is zero and any values away from zero indicate deviation from the normal.
- The Kolmogorov-Smirnov Z-test is a test of normality, where values in the sample are compared to a normally distributed set of values with the same mean and standard deviation. Non-significant results ( $p>0.5$ ) indicate normality, whereas significant results ( $p<0.5$ ) indicate a distribution which is significantly different from a normal distribution. Pallant (2004) points out that breaches of assumed normality are not unusual.

From Appendix XIV, most of the variables are not normally distributed. Field (2005) points out that it is quite rare to obtain normal distributions for all items tested.

### **8.3.2 Scale Reliability**

The reliability of scales in quantitative surveys and subsequent analysis is an important consideration. Field (2005, 667) notes that 'in statistical terms, the

usual way to look at reliability is based on the idea that individual items (or sets of items) should produce results consistent with the overall questionnaire.' Sekeran (2000) explained several measures which have been established in order to test internal consistency: "item-total-correlation" and Cronbach's alpha". The figures generated by the two measures provide an indication of the degree to which each item correlates with the total score. Pallant (2005), explains that if the 'item-total-correlation' is lower than 0.3, it indicates that the item is measuring something different from the scale as a whole. The author also recommends an acceptable Cronbach's alpha value of 0.7. However, if scores fall below 0.7, items might have to be pruned in order to increase the reliability of the scale. The reliability tests were conducted through SPSS producing a Cronbach alpha coefficient of 0.949. For all the factors except economic, infrastructure and spatial, the Cronbach alpha coefficient was 0.949 indicating a good reliability of this scale.

- Economic factor: the Cronbach alpha coefficient was 0.880. Two factors 'an open market economy' and 'few restrictions on trade' fell below the recommended 0.3 value in the 'item-to-correlation'. Another round of tests was conducted without the two sub-factors and the Cronbach alpha coefficient fell to 0.860. Hence, for the purposes of subsequent analysis, all items in the scale were therefore retained.
- Infrastructure factor: the Cronbach alpha coefficient was 0.770. Three sub-factors 'maritime port access', 'road access' and 'rail access' fell below the recommended 0.3 value in the 'item-to-correlation'. Another round of testing was conducted without the two sub-factors and the Cronbach alpha

coefficient fell to 0.737. Hence, for the purposes of subsequent analysis, all items in the scale were therefore retained.

- Spatial factor: the Cronbach alpha coefficient was 0.850. One factor 'a good supply of plentiful and cheap land' fell below the recommended 0.3 value in the 'item-to-correlation'. Another round of test was conducted without the sub-factor and the Cronbach alpha coefficient fell to 0.808. Hence, for the purposes of subsequent analysis, all items in the scale were therefore retained.

After conducting subsequent tests of the items above, 8 factors involving 58 variables qualified for subsequent analysis.

### **8.3.3 Further Findings**

#### **8.3.3.1 RQ7 – Relative Importance of Location Factors**

Table 8.16 shows the mean and standard deviation of the top sub-factors. *Road access* is regarded as the most important (mean = 4.68). *SEZs* is the second most important factor (mean = 4.58). *Good supply of plentiful and cheap land* (mean 4.55), *rail access* (mean = 4.45), *telephone and internet infrastructure* (mean = 4.42), *supplies of energy and electricity* (mean = 4.42), *availability of raw materials* (mean = 4.21), *availability of natural resources* (mean = 4.21) and *government and officials support business* (mean = 4.21) are the next important factors. From the list of factors, it can be determine that 'economic', 'infrastructure' and 'spatial' factors are regarded as important by ROK SMEs and logistics companies' when determining their location decisions.

<b>Factors</b>	<b>Grouping</b>	<b>Mean<sup>a</sup></b>	<b>St. Dev</b>
Road access	Infrastructure	4.677	0.546
Special Economic Zones	Economic	4.585	0.656
Good supply of plentiful and cheap land	Spatial	4.554	0.636
Rail access	Infrastructure	4.454	0.624
Telephone and internet infrastructure	Infrastructure	4.423	0.555
Supplies of energy/electricity	Infrastructure	4.415	0.594
Availability of raw materials	Spatial	4.331	0.675
Availability of natural resources	Spatial	4.208	0.723
Government and officials support business	Political	4.208	0.733
Good supply of low labour cost	Social	4.138	0.607
Low costs of relocation	Economic	4.108	0.662
Proximity to major suppliers	Spatial	4.092	0.616
An open market economy	Economic	4.077	0.537
Good access to markets in China and Japan	Spatial	4.069	0.661
Few restrictions on trade	Economic	4.069	0.485
Good logistics linkages and accessibility	Organisational	4.062	0.632
Reforms encouraging a market economy	Economic	4.023	0.577
Clear rules governing regulation and contracts	Legal	3.992	0.604
Maritime port access	Infrastructure	3.977	0.742
Good logistics distribution system	Organisational	3.969	0.634
Supplies of water and sewage disposal	Infrastructure	3.954	0.657
Labour/tax laws do not change suddenly	Legal	3.915	0.635
Availability of industrial estates	Spatial	3.900	0.608
Proximity to regional markets	Spatial	3.892	0.900
Potential for unification	Political	3.869	0.811
New regulations are not suddenly imposed	Legal	3.838	0.680
Local/Regional development	Economic	3.831	0.684
Educated labour pool with requisite skills	Social	3.823	0.919
Flexible payment methods	Legal	3.808	0.672
Low set-up costs for new local establishments	Economic	3.731	0.775
Few currency restrictions	Economic	3.723	0.737
Low levels of exchange rate risk	Economic	3.708	0.664
Logistics facilities	Infrastructure	3.692	0.756

**Table 8.16: Relative importance of location factors**

### **8.3.3.2 SMEs and Logistics Companies**

Out of the 58 variables under the 8 factors, a Mann-Whitney U test indicated that the central tendency of the opinions of SMEs and logistics companies were



significantly different except for three sub-factors, 'few trade restrictions' ( $p = 0.621$ ), 'logistics facilities' ( $p = 0.603$ ) and 'road access' ( $p = 0.712$ ). For the rest of other factors, SMEs' mean ranks were higher than logistics companies except for four sub-factors – 'maritime port access', 'road access', 'rail access' and 'inexpensive land'. It shows that logistics companies view these four sub-factors as more important than SMEs.

#### **8.3.3.3 Small and Large Companies**

Eighty-seven small companies and 43 large companies were subjected to a Mann-Whitney U test to observe any significant differences between both groups. The results showed that 21 sub-factors were significantly different under all headings except, political factor.

Under the economic factor, large companies view four sub-factors as more important than small companies. These include 'presence of a clustering of common industries' ( $p = 0.000$ ), 'low costs of relocation' ( $p = 0.019$ ), 'a culture which encourages earning high profits' ( $p = 0.033$ ) and 'low set up costs for new establishments' ( $p = 0.006$ ).

Under the infrastructure factor, two sub-factors were indicated as significantly different. Large companies (mean rank = 80.03) viewed 'access to domestic markets' ( $p = 0.001$ ) as more important than small companies (mean rank = 58.32). On the contrary, small companies (mean rank = 70.44) indicate the importance of 'rail access' ( $p = 0.016$ ) higher than large companies (mean rank = 55.50).

Under the legal factor, large companies view three sub-factors as more important than small companies. These sub-factors include, 'flexible immigration policies' ( $p = 0.000$ ), 'low personal income taxes for foreign employees' ( $p = 0.000$ ) and 'clear laws governing logistical practices' ( $p = 0.041$ ).

Under the managerial factor, large companies view four sub-factors that managers in DPRK should possess as more important than small companies. These sub-factors include, 'good knowledge of logistics concepts' ( $p = 0.002$ ), 'good management experience' ( $p = 0.000$ ) and 'good knowledge of management concepts' ( $p = 0.001$ ).

Under the spatial factor, large companies view four sub-factors as more important than small companies. These sub-factors include 'gaining a bridgehead into the DPRK market' ( $p = 0.000$ ), 'the promise of new markets for DPRK products' ( $p = 0.012$ ), 'a lack of sizable markets' ( $p = 0.001$ ), and 'the limited purchasing power of local markets' ( $p = 0.000$ ).

Under the social factor, large companies view four sub-factors as more important than small companies. These include, 'good housing, schools and environmental amenities' ( $p = 0.000$ ), 'a pool of educated labour' ( $p = 0.021$ ), 'cultural affinity with other Koreans' ( $p = 0.015$ ), and 'common culture and language' ( $p = 0.001$ ).

Under the organisational factor, large companies (mean rank = 75.49) view 'availability of plentiful of modern logistics service providers and low costs' ( $p = 0.028$ ) more importantly than small companies (mean rank = 60.56).

#### **8.3.3.4 SMEs' Size of Investment**

Responses of 80 SMEs were subjected to the Mann-Whitney U test based on their size of investment, those investing less than US\$10 million and those investing more than US\$10 million, to observe any significant differences between both groups. The results showed that 12 sub-factors were significantly different under all factors, except political factor and organisational factor.

On the economic factor, companies investing more than US\$10million (mean rank = 43.00) indicated that having 'few currency restrictions' ( $p = 0.047$ ) as more important than those companies investing less than US\$10 million (mean rank = 39.88).

Under infrastructure, companies investing more than \$10 million viewed the 'access to domestic markets' ( $p = 0.004$ ) and 'availability of logistics facilities' ( $p = 0.038$ ) as significantly more important than those investing less than \$10 million.

On the legal factor, companies investing more than US\$10 million viewed six sub-factors as significantly different from those investing less than US\$10 million. These include, 'flexible immigration policies' ( $p = 0.007$ ), 'personal income taxes for foreign employees are low' ( $p = 0.012$ ), 'clear laws governing logistical policies' ( $p = 0.038$ ), 'clear rules governing regulation and contracts' ( $p = 0.008$ ), 'labour and tax laws do not change suddenly' ( $p = 0.037$ ), and 'new regulations are not suddenly imposed' ( $p = 0.042$ ).

On the managerial factor, companies investing more than US\$10 million (mean rank = 54.19) viewed that managers in DPRK having 'good knowledge of

logistics concepts' ( $p = 0.006$ ) more importantly than those investing less than \$10 million (mean rank = 37.08).

On the social factor, companies investing more than US\$10 million rated two factors as significantly different from those investing less than US\$10 million. These factors include, 'good housing, schools and environmental amenities' ( $p = 0.012$ ) and 'good supply of low labour cost' ( $p = 0.014$ ).

#### **8.3.3.5 Logistics Companies**

Responses of 50 logistics companies were subjected to the Mann-Whitney U test based on their involvement in DPRK. 12 companies indicated that they have had previous operations in DPRK while 38 companies did not have prior operations in DPRK. The results showed that companies with no previous operations (mean rank = 27.63) rated 'political stability' ( $p = 0.039$ ) more importantly than those who have had previous involvement in DPRK. Similarly, companies without prior involvement (mean rank = 27.63) view 'profit making culture' ( $p = 0.039$ ) more importantly than those with previous involvement (mean rank = 18.75).

### **8.4 Principal Component Analysis (PCA)**

Factor analysis has been used in determining location factors (Westerbeek and Smith, 2002; and Alcorta et al., 2009). It is defined as a method for simplifying complex sets of data (Kline, 1994) by addressing the structure of interrelationships or correlations among a large number of variables by defining a set of common underlying dimensions (Hair et al., 1992). Pallant (2005, 172) explains that 'factor analysis, essentially a data reduction technique, takes a

large set of variables and looks for a way that the data may be ‘reduced’ or summarised using a smaller set of factors or components’. There are two main approaches to factor analysis – exploratory and confirmatory. The former is often used in early stages of research to gather information about the interrelationships among a set of variables while the latter is used later in the research process to confirm specific hypotheses concerning the structure underlying a set of variables.

Factor analysis consists of a variety of different, yet related techniques – principal component analysis (PCA) and factor analysis (FA). In principal component analysis the variables are transformed into a smaller set of linear combinations, with all of the variance in the variables being used. In factor analysis, factors are estimated using a mathematical model where only the shared variance is analysed (Tabachnick and Fidell, 2001). Pallant (2005, 172) mentions that ‘these two set of techniques are similar in many ways and often used interchangeably by researchers’. Stevens (1996) prefers principal component analysis by suggesting that it avoids some of the potential problems with ‘factor indeterminacy’ associated with factor analysis. Tabachnick and Fidell (2001, 611) further explain that ‘if an empirical summary of the data set is required, PCA is the better choice’.

George and Mallery (2001) recommend four basic steps of conducting a principal component analysis, while Pallant (2005) suggest a three-stage approach: First, assessment of the suitability of the data for factor analysis. Second, factor extraction and third, factor rotation and interpretation. These steps and the findings generated will be presented in the following sections.

The variables were subjected to a principal component analysis (PCA) using SPSS Version 16.

#### **8.4.1 Assessment of the Suitability of Data for Principal Component Analysis**

There are two main issues when assessing the suitability of the data: sample size and the strength of the relationship among variables.

The sample size determines the reliability of factor analysis as correlation coefficients fluctuate from smaller to larger samples. Pallant (2005) recommends that the larger the sample, the better. Field (2005) becomes precise by listing 100 cases as a poor sample to 1000 cases as being excellent. In addition, Kline (1994) recommends a minimum of 100 as a sample size suitable for factor analysis, whereas Hair et al. (1992) emphasise that the sample size should be 100 or larger. Stevens (1996, 372) suggest that the sample size requirements advocated by researchers have been reducing over the years as more research had been done on the topic.

The second important issue relating to the assessment of data suitability is the appropriate strength among variables. Tabachnick and Fidell (2001) recommend an inspection of the correlation matrix for evident of coefficients greater than 0.3. Factor analysis may not be appropriate if only few correlations above this level are found. The inspection of the correlation matrix produced for all 58 variables under eight headings revealed the presence of many coefficients greater than 0.3. Pallant (2005) mentions two other measures for testing the strengths of correlation between items is: (i) Bartlett's test of sphericity (1954) and the Kaiser-Meyer-Olkin (KMO) measure of sampling

adequacy (1974). The Bartlett's test of sphericity should be significant ( $p < 0.5$ ) for factor analysis to be considered appropriate while the KMO index ranges from 0 to 1, with 0.6 suggest as the minimum value for a good factor analysis and values greater than 0.8 is considered very good. In this study, the Bartlett's test of sphericity reached statistical significance with  $p = 0.000$  and therefore rejecting the notion that the correlation matrix is an identity matrix. The KMO measure of sampling adequacy is 0.805, indicating a very good value, therefore supporting the factorability of the correlation matrix.

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</b>		.805
<b>Bartlett's Test of Sphericity</b>	<b>Approx. Chi-Square</b>	5905.247
	<b>Df</b>	1653.000
	<b>Sig.</b>	.000

**Table 8.17: Assessment of factorability of data**

#### **8.4.2 Extraction of Factors**

According to Pallant (2005), factor extraction seeks to identify the smallest number of factors that can be used to best represent the interrelations among the set of variables. The principal component analysis identifies those factors which mainly account for the variance by analysing all the variance in the observed variables.

Pallant (2005) recommends three techniques to assist in deciding the number of factors to retain. The Kaiser's criterion or eigenvalue (i.e. amount of the total variance explained by a factor) rule retains those factors with eigenvalue of 1.0 or above. However, the Kaiser's criterion has been widely criticised for retaining

too many factors and that findings are likely to be inaccurate when the number of variables is larger than 30 or the sample size is fewer than 250 (Field 2005).

The next technique is Catell's scree test (Catell 1966), which involves plotting each of the eigenvalues of the factors and inspecting the plot to find a point at which the shape of the curve changes direction and becomes horizontal. Catell (1966) recommends retaining all factors above this cut-off point.

The third technique is Horn's parallel analysis (Horn 1965) which is increasingly used in social science research. It involves comparing the size of the eigenvalues with those obtained from a generated data set of the same size. Only those eigenvalues that exceed the corresponding values from the random data set are retained (Pallant 2005). This approach to identifying the correct number of components to retain has been shown to be the most accurate, with both Kaiser's criterion and Catell's scree test tending to overestimate the number of components (Hubbard and Allen, 1987 and Zwick and Velicer, 1986). In order to conduct this parallel analysis, another statistical program 'Monte Carlo PCA for Parallel Analysis' was used (Watkins 2000). The program requires three pieces of information: the number of variables, the number of subjects in the sample and the number of replications. This program will calculate the average eigenvalues for these 100 randomly generated samples.

The variables were subjected to a principal component analysis. Analysis was conducted to identify variables with eigenvalues of 1 or more. Screeplot tests were analysis to detect the cut-off points. Lastly, parallel analysis was conducted for further investigation to compare the eigenvalues generated by the principal component analysis in SPSS and the Monte Carlo PCA. After



comparison of the three guidelines, it was decided to retain four components for further investigation.

Component	Actual eigenvalue from PCA	Criterion Value from parallel analysis	Decision
1	16.072	2.482	Accept
2	5.509	2.214	Accept
3	3.642	2.118	Accept
4	3.273	2.042	Accept

**Table 8.18: Comparison of eigenvalues from PCA and Parallel Analysis**

#### **8.4.3 Rotation and Interpretation of Factors**

The extracted sub-factors need to be interpreted in order to make sense. To assist in this process, the factors are 'rotated' (Pallant 2005). Rotation can improve the interpretability of factors as it maximises the loading of each variable on one of the extracted factors and minimises the loadings on all other factors (Field 2005, 634). There are two main approaches to rotation – orthogonal (uncorrelated) or oblique (correlated) factor solutions. The recommendation of Tabachnick and Fidell (2001) to select orthogonal varimax rotation results in solutions that are easier to interpret and to report. It also minimises the number of variables that have high loadings on each factor (Pallant 2005).

Kline (1994, 52) emphasises that 'it is necessary to know whether a factor loading is significant or not' regardless of the rotation method used. Pallant (2005) supports Kline's (1994) proposition of using factors loadings over 0.3 as a reasonable criterion when sample size is at least 100 subjects. Comrey (1973) and Miller et al. (2002) recommend that anything above 0.44 can be considered significant. It is fair to conclude that the higher the loadings the more the

variable is a pure measure of the factor (Buuhler 2006). Therefore it has been decided to retain factor loadings of above 0.44. The rotated solution revealed four factors explaining 49.131% of total variance in the proposed model.

Comp	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cum %	Total	% of Variance	Cum %
1	16.072	27.710	27.710	16.072	27.710	27.710
2	5.509	9.498	37.209	5.509	9.498	37.209
3	3.642	6.279	43.488	3.642	6.279	43.488
4	3.273	5.644	49.131	3.273	5.644	49.131

**Table 8.19: Total variance explained**

In the component rotated matrix (Appendix XV), the loadings of each of the selected variables are shown. Pallant (2005) notes that SPSS does not interpret or label the components and it is up to the researcher to propose possible interpretations based on underlying theory and understanding of the content of the variables. It is recommended to identify the highest loading variables of each of the component which can be used to help identify the nature of the underlying latent variable represented by each component. Therefore the author of this thesis interpreted and labelled the components by comparing the various items and their wordings respectively. After that the results are compared and discussed with each other.

- Component 1: *'legal factor'*

Twenty variables load significantly on the first factor explaining 27.71% of the variance. The three strongest loadings relate to the legal factor which indicates that the investors are concerned about the legal environment of conducting businesses in DPRK. 'New regulations are not imposed suddenly' (.861) and 'labour and tax laws do not change suddenly' (.850) indicate that potential investors are concerned about sudden changes in laws which have occurred to

ROK companies in Kaesong Industrial Complex. 'Low income tax for foreign employees' (.828) demonstrates that investors are concerned about the income tax structure which might be related to sudden changes in labour and tax laws.

- Component 2: '*political economy factor*'

Twelve variables load on the second component explaining 9.49% of the variance. Comparison of the wordings shows that the highest loadings involve sub-factors in the political and economic grouping. The loadings of the top four economic factors as well as the two political factors indicate that potential investors are concerned about the business environment in DPRK. They rate the importance of having 'good levels of local and regional development' (.744) complemented with 'special economic zones' (.638) and 'low levels of currency exchange rate risk' (.614). Investors also rate the importance of 'potential unification' (.672) that will eventually lead to reforms encouraging a market economy (.604). In conducting business in DPRK, other concerns include the level of bureaucracy (.583) and risk of corruption (.537), which is prevalent in transition economies.

- Component 3: '*spatial factor*'

Twelve variables load on the third component explaining 6.27% of the variance. The five strongest loadings relate to the spatial scale and it is clear from the wordings that the investors are concerned about the supply chain of their products. 'Availability of raw materials' (.705), 'availability of natural resources' (.660), 'proximity of major suppliers' (.641) and 'inexpensive land' (.625) indicates the upstream in the supply chain where investors seek for the inputs of products. 'Access to China and Japan' (.600), 'access to domestic markets'

(.598), and 'proximity to regional markets' (.541) refer to the downstream in the supply chain where investors seek for export markets for their products.

- Component 4: '*infrastructure factor*'

Eight variables load on the fourth component explaining 5.64% of the variance. The six strongest loadings relate to the infrastructure scale and it becomes clear that investors are concerned about the state of the infrastructure in DPRK. 'Access to road' (.796) and 'access to rail' (.657) indicate the level of importance attached to DPRK rehabilitating railroads to provide access to raw materials and natural resources as well as improving the distribution system for exports.

## **8.5 Summary**

The next chapter will connect the above findings in the context of this research by linking the results of the qualitative and quantitative research with the exploratory study to complete the triangulation process.

## CHAPTER 9 – ANALYSIS AND DISCUSSION OF FINDINGS

This chapter presents the analysis of both the qualitative and quantitative research to draw together the key points for further discussion of the research questions. It will also triangulate the main findings of the qualitative interviews (Chapter 7) and the quantitative surveys (Chapter 8) with the exploratory study (Chapter 6) as illustrated in Figure 9.1 to answer the research questions.

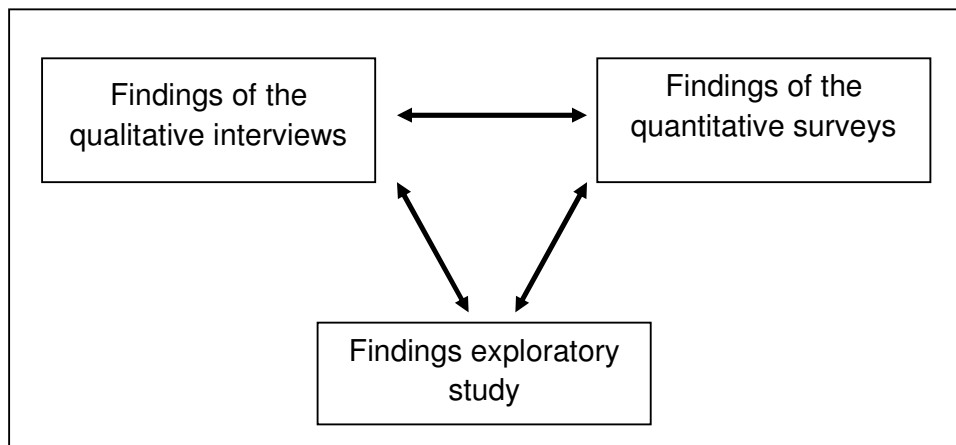


Figure 9.1: triangulation of findings.

### 9.1 Analysis of Qualitative Findings

This section will discuss the findings of the qualitative interviews under several themes and highlight the key points made by experts which will aid in developing scenarios for DPRK.

The main political and economic issues surrounding DPRK are similar to those raised during the exploratory interviews – nuclear issue, economic problems and succession. These problems have been well-documented in the literature. It is imperative that when taking into account the scenarios for DPRK, these two factors are included. In the development of scenarios, often wildcards are used to account for any sudden events occurring. In this case, the wildcard would be the death of Kim Jong-il. His death would pose stability issues not only to DPRK

but to the whole of Northeast Asia as it might trigger a collapse or uprising. However, history has shown that DPRK has continued to be resilient even after the death of Kim Ji-sung.

DPRK presents its stakeholders with many political and economic interests. To its immediate neighbours – China and ROK, long term stability is imperative as a collapse will bring about a sudden influx of immigrants across its borders. This will result in instability in the region which will require huge humanitarian aid. Economically, a collapse-DPRK will also pose huge reunification costs for ROK, which it cannot afford. The status quo scenario will allow both countries, especially China, to contribute in keeping DPRK sustainable through economic projects such as infrastructure and minerals. The USA is more concerned with the nuclear proliferation as its influence in the region is marginal given that DPRK has been on its blacklist for many years. Japan's interest is similar to USA, to maintain stability in the Peninsula and also to solve the long-standing abduction issue. Russia has benefitted from DPRK's debt to the country, where it is able to invest in several infrastructure projects in the Rajin-Sonbong area. Like other countries, Russia would want regional stability and to increase its influence gradually. In building scenarios for DPRK, the interests of different stakeholders need to be factored in as they will have influence the eventual future of the country.

In 2008, experts were asked the most likely scenario that will occur in DPRK within a 5-7 time period. It is not surprising that most experts favour a status quo scenario as any other scenario will bring about regional instability and also huge economic ramifications which no country is willing to put up with. Under

this scenario, most of the economic aid/investment would only come from ROK and China while USA and Japan continues to maintain an arm's length approach. However, the experts were more optimistic when asked about the possibility of a reunification within the next 30 years. As China and ROK continues to bring about gradual investment in DPRK to bring up the level of infrastructure in the country, the possibility of economic integration will be in the pipeline. ROK would have learnt the lessons from the German reunification that it is costly to develop the infrastructure in the East to bring it up to the level in the West. Hence, neither ROK nor China would want a similar occurrence.

Experts regard road transport as the top investment priority in any scenario. However, the transport strategies in each scenario will differ as political and economic conditions vary. In the status quo scenario, transport developments would be piecemeal as DPRK would be selective in allowing foreign investment as transport infrastructure has never been regarded as a key component in its economic plan as established in Chapter 2. In the event of a collapse, electricity supply will be a priority to provide energy to the country. Ports would play an important role to ensure that humanitarian aid enters into the country. Tourism is expected to play gradual importance to the economy while in order to stabilise the economy, SEZs could be designated to induce foreign investment. In the peaceful reunification scenario, international financial institutions will be able to provide funding and investment to the rebuild infrastructure.

Experts' suggestions on the areas/disciplines which DPRK managers can acquire further knowledge yielded different responses. This is not surprising given that DPRK managers lack the motivation to acquire further skills as it

seldom interacts on a global scale. However, it is worth noting that DPRK managers should begin to acquire more knowledge of the global trade and financial system to aid in its currency control and banking system. As infrastructure projects increases, DPRK managers could acquire further skills in transport infrastructure and engineering fields.

Experts suggested that DPRK focus on primary and light industry for export markets targeting China, ROK and Russia. DPRK-made products do not possess international recognition due to the unresolved nuclear issue. Hence, the only reasonable markets that will buy DPRK-made products would be its neighbouring countries. Alternatively, ROK companies might engage in the processing on commission trade where the initial assembly is being done in DPRK and the final stage of the supply chain process (i.e. packaging/labelling) will be sent back to ROK. DPRK also possesses a wealth of minerals, which have been largely untapped due to flooded mines (Yoon 2011). If DPRK is able to generate and assure investors that their investment will be protected, then it will be able to generate significant revenue from the mining industry. This in turn will have implications on the transport infrastructure as roads and railways need to be constructed to facilitate the transportation of the minerals across the borders to China and ROK or through ports to farther countries.

## **9.2 Analysis of Quantitative Findings**

This section analyses the quantitative findings derived from both SMEs and logistics companies survey. The findings were subjected to non-parametric tests and principal component analysis to reduce the data for further analysis.



These data analyses and findings aided in answering the sub-research questions.

All but three of the managers who have had more than 10 years experience in their industry have also worked in the same company for a similar duration. This shows that the top-level managers are more than qualified to comment on the policy of their company. The majority of the SMEs are likely to be cautious with their investments ranging from US\$1-9 million.

SMEs were divided into small and large SMEs to infer any differences in their choice of location factors. A total of 21 factors were found to differ significantly which provides insights into the factors that are important to large SMEs. The only group of factors where both large and small SMEs do not have any significant difference were the 'political' factors. This could imply that all companies view resolution of political factors as of equal importance for any level of economic activity to increase.

The presence of common clusters of industries was important to large companies as supply chains are viewed as networks rather than as independent entities. The presence of common industries would lower operational costs in the form of transport and carrying costs. In addition, low relocation costs and setup costs offers greater motivation for large SMEs to relocate due to their size of personnel and operations. It would not be economically viable if relocation costs are too huge. This is confirmed in their view that there should be low personal income taxes for foreign employees. Large companies also viewed access to domestic markets as a potential for extending their scope of business as they look out for new opportunities. This is

confirmed in their view that gaining a bridgehead into the DPRK market – a first mover advantage, is important.

Logistics companies with no prior experience in DPRK are more concerned about the political risk in the country. This is perhaps due to the instability around the region and the fact that the Korean Peninsula is still officially at war. In addition, a profit making culture is also more important to these companies. This is predictable if companies with prior involvement understand the risks and level of logistics activity available in DPRK and that any profit making is only marginal.

### **9.3 RQ 1 – Impacts of DPRK Scenarios on Transport and Logistics Developments in DPRK**

This section discusses the analysis of the scenarios generated in the qualitative interviews to provide recommendations for potential transport and logistics developments under each scenario. After analysing the qualitative findings, three scenarios were further developed: (a) status quo/muddling through (b) collapse arising from military coup, social uprising or complete disintegration resulting in absorption and (c) peaceful unification. This study focuses on these three scenarios analysing the interests of various actors, including internal and external developments to evaluate its effects on transport developments.

This analysis proceeds under a number of assumptions to generate the recommendations. Firstly, the DPRK regime is most concerned with regime survival. Secondly, maintenance of political stability in DPRK is paramount for all concerned stakeholders. Thirdly, transport infrastructure development is a precondition for economic development in DPRK. Lastly, any change in

president in ROK might signal a change in policies towards DPRK. There are several wildcards involved. The death of Kim Jong-il would trigger a greater uncertainty in the region even though a successor has already been named. It could spark an internal conflict amongst the different factions. Another wildcard is the weather as DPRK is susceptible to famine and flooding.

### **9.3.1 Status Quo**

In spite of the nuclear crisis, the status quo is one of the two scenarios that most experts agree is most likely to occur in the near future. They anticipate that the surrounding countries would not want a collapsed-DPRK as it poses extreme difficulties. For China and ROK, there would be a sudden influx of asylum seekers from DPRK, which is undesirable for both countries. DPRK will continue with its existing policy, government institutions and ruling regime as regime survival is paramount to Kim Jong-il and his eventual successor. He continues to consolidate his power base among the military. Outside pressures from the USA and Japan can contribute to sustaining the present regime, at least in the short run, by strengthening the position of the military and enhancing internal cohesion.

In this scenario, DPRK is likely to announce that it will stop testing nuclear weapons but stop short of complete dismantlement. China and ROK will resume supply of oil and food aid to DPRK to keep it as a buffer state. ROK continues with the Kaesong Industrial Park complex and Mt. Kumgang tourism project. The USA is unlikely to change its hard-line stance unless DPRK gives up its nuclear weapons. Japan is likely to continue its economic sanctions on DPRK. International financial institutions and organisations will play an

insignificant role at this stage except for some food aid. DPRK might attempt to carry out some piecemeal reforms to improve productivity and liberalise its economy (e.g. currency reforms in 2009) but China and ROK are most likely to be the only countries responding.

In the area of transport and logistics, developments are likely to be slow and tedious with minimal developments around the country. Only ROK and China will show some serious interest, although there are some reported interests from Russia. ROK will continue to place the restoration of the TKR construction projects as priority with port and road-related projects to be considered at a later stage. China's trade with DPRK is likely to pick up near the border areas along the Yalu River. Chinese companies have secure berths in Rajin Port with road construction projects from Hunchun to Rajin. It is likely that there will be investments from China into the new Dandong-Sinuiju Bridge to facilitate further trade. According to two experts, Russia has proposed to construct the Khasan-Rajin railway line which will facilitate delivery of oil to Sonbong refinery. Some of the refined oil will be sent back to Russia while the rest will be used by DPRK for energy purposes. This proposed deal will benefit both countries in the long term.

### **9.3.2 Collapse**

This is the next scenario which experts think is most likely to occur. This is due partly to the dire state of the DPRK economy coupled with UN sanctions. It has been reported by the World Food Programme that it is facing a shortfall in food aid for 2011. Such economic hardships might result in severe social unrest. Social control and political intimidation can ensure the regime's short term

survival but in the medium term there is great danger of sudden implosion in the form of mass riots (Moon, 2004). Collapse in DPRK could take one of the three paths (i) Romanian (ii) Iraqi or (iii) Lebanese. The Romanian path results in the collapse of the present regime with the successor regime retaining political and military control. This will create severe social, economic and political unrest leading to the population fighting for limited resources and migrating north across the Tumen and Yalu rivers and South across the DMZ. As mentioned earlier, this scenario is not desired by China and ROK. For the latter, it imposes a significant burden on support structures, military and security apparatus. The Iraqi path results in DPRK waging war against ROK and ultimately collapse and absorption through external intervention. The Lebanese path results in severe civil war and a successor regime inviting foreign intervention. Most experts agree that this scenario is unlikely to happen in the short term period of 5 to 10 years. DPRK has demonstrated a resolute ability to survive in the harshest circumstances, e.g. the death of Kim Il-Sung and natural disasters in the 1990s.

In the event of collapse and absorption, infrastructure conditions are likely to deteriorate as a result, leading to huge investments and reconstruction needed in the transport and logistics sector. The countries involved will have to play a joint role in DPRK with either ROK or the UN leading. In this scenario, stakeholders will jostle for territorial advantage as each looks to gain a foothold in the country. However, no country will be able to single-handedly afford the cost of rebuilding DPRK hence it is mostly like a joint effort. ROK and China will most likely spearhead most of the investment required. Russia will be able to provide some aid in terms energy and financing. Japan will provide compensation payments as a result of WWII. The USA will look to provide a

greater security role to ensure that there is continued stability in the region. In addition, some economic assistance in the form of aid and energy can be expected to be supplied. The UN will provide humanitarian and developmental assistance to rebuild the country. IFIs like the WB and ADB will provide expertise to work together with other countries to develop a timeline for developmental projects and also provide the necessary financing loans.

Transport strategies will occur in several phases. In the initial six to seven years, as suggested by Van Hippel and Hayes (1997), a Light Water Reactor (LWR) should be constructed to supply energy to the whole country. DPRK could begin to build up its economy by learning from China through focusing on its border areas by adding one or two SEZs (e.g. Sinuiju) to the existing ones in Kaesong and Rajin-Sonbong, engaging in primary and light industries as suggested by experts and SMEs through the qualitative interviews and surveys respectively. Some ports (e.g. Haeju, Nampo and Wonsan) could be upgraded to enable the supply of international humanitarian aid and to facilitate future trade movements. At the same time, road connection to these ports should be improved to ensure smooth transport flow. With the rebuilding of the country, one sector which can help DPRK to grow economically will be the tourism industry (Jo and Adler 2002). Roads connections to Mt. Gungang and Mt. Paektu tourist sites should be improved. In the second stage between eight to fifteen years, with the stability of the economy, more SEZs (e.g. Nampo and Wonsan) can be designated to induce foreign investment focusing on export oriented light industries plus some heavy industries. At the same time, the UN 'Tumen River Development Programme' can be revitalised with the agreement of China, Russia and DPRK. Other projects include the renovation of Pyongyang-Sinuiju

and Seoul-Wonsan rail projects. More power plants could be completed and the communication system improved in major cities. In the third stage after more than 20 years, strategies include enhancing the value of export industries by including some information industries. Other projects include the double tracking of arterial railways and road expansion between major cities to facilitate the movement of goods and services. As travel movement becomes widespread together with an upsurge in tourism industry, the author suggests that airports could be constructed in major cities.

### **9.3.3 Peaceful Reunification**

Experts interviewed say that this is an unlikely course of action in the near future of at least 10 years by the present regime due to the acute ideological, political and security animosities of the last half century. In this scenario, Kim Jong-il (or the leader-in-charge) seeks reconciliation with ROK to maintain peace and stability. This scenario requires both countries to accept each other as full negotiating partners and to sign the armistice to officially end the war. Reunification will occur after a period of at least 15 years (Pollack and Lee, 1999). The initial three to four years would focus on dialogues and economic reforms for DPRK and disarmament of nuclear arms. After six to seven years, there could be a political integration either through a confederation with joint governments engaging in political and economic integration. Within 10-15 years, it is likely that there will be a formal unification with unified defence forces. Both countries will be cautious to hasten the reunification process as they would have learnt from the lessons of the German unification.

In this scenario, ROK will most likely play a leading role in investment projects encouraging FDI into DPRK. The USA will begin withdrawal of troops provided that DPRK gives genuine assurance of its intention to reunification. The USA could begin to supply energy sources in stages and also provide some financing for investment projects after removing DPRK from its 'blacklist'. At the same time, DPRK will be able to improve its opportunities for investment and loans from IFIs. China will continue to provide investments along the border areas albeit taking a cautious approach, preferring to let ROK take the lead. However, as China will not want to lose a foothold in DPRK, the author thinks it might seek to invest in key areas such as minerals and transport infrastructure. Japan will provide compensation payments and would be interested in transport projects on the east side of DPRK, e.g. Rajin and Chongjin to enable access to China and Wonsan for the tourism industry. Russia will be interested in reconnecting railway lines on the east side to create an overland route from Busan to Europe.

Rehabilitation of infrastructure in this scenario is less complex compared to the collapse scenario as the infrastructure will likely be in a better condition. The transport network in DPRK will be integrated with the South. Kim (2006), proposed an H-design construction composed of four corners (6 corners in the second stage) and three axes to lift the DPRK economy and connect to the regional economy of Northeast Asia. In the first stage of three to four years, four corners namely, Sinuiju, Nampo, Wonsan and Rajin are suggested. These corners are located near the borders with Sinuiju bordering China, Nampo within proximity of China and ROK, Wonsan with access to Japan and ROK and, Rajin located closely to Russia and China. Suggested projects include



reconstruction of the railway lines along the east and west coast, designating SEZs, providing electricity to Kaesong Industrial Complex and Mt. Kumgan tourist zone, Rajin port renovation, construction of Dandong-Sinuiju Bridge and integrating communication facilities. It is expected that ROK will provide most of the finance supported by international multilateral organisations. After six to seven years, as DPRK moves further into its reform path, public and private investment can flow into the country. Major arterial railways and roads begin construction to connect them country-wide. The UNESCAP can play an important role in providing expertise and resources as they already have plans for the TAR and Asian Highway of which DPRK is directly involved in two of the routes. Other projects could include port expansion and reconstruction of roads in border areas, new power plants and distribution networks, and mobile communication and data transmission facilities. In the third stage after 10 to 15 years, infrastructure requirements could be met by internal and external financial sources and the remaining minor roads and railways will be constructed to raise the efficiency of the economy. At the same time, the author thinks that selected airports around the country could be constructed to meet the expected rising demand of the tourism industry and high-value exports.

#### **9.3.4 Summary**

The transport and logistics developmental projects listed under each scenario are purely speculative due to data shortage. However, the suggestions provided have been analysed and developed through the interviews and available information through literature. In the short term of five to ten years, DPRK is most likely to continue with the status quo scenario as it has continued to show reliance on the military-first policy and resilience in times of difficulties. In

addition, surrounding countries like ROK and China would also prefer this scenario as it provides the most ideal political and economic stability. In the event of a collapse, there will be political instability with influx of immigrants and the costs of rebuilding the country would be enormous (Noland 2006). A reunification would also present strong resistance and barriers to a political union and incur huge reunification costs to ROK, which it can ill-afford at the moment.

#### **9.4 RQ2 – Future SEZ Locations in DPRK**

Chapter 2 introduced the concept of SEZs in DPRK, which are physically and legally separated from the rest of the country, with special economic incentives given to foreign companies. Examples of SEZs in DPRK include Rajin-Sonbong FTZ, Sinuiju Administrative Zone (SAZ) and Kaesong. The first two ended in failure due to a lack of investment and poor planning.

In the SMEs' questionnaire, companies were asked about the potential locations for future investment. The results show that investors favour locations located on the west coast with 37.5% choosing Nampo as their top destination for future investment. French (2004) deems Nampo as the most important port in DPRK. It has frequent sailings with Shanghai and Dalian as well as irregular services to the Middle East and Europe. There are also regular routes between Incheon and Nampo. It is seen as an ideal place because of the newly constructed container terminal a few years ago. Its favourable geographical position allows it to take advantage of any exports from Kaesong to China and/or ROK. In addition, there are several gold (Suan) and iron (Eun-yul) mines located nearby, which can be exported out of Nampo. During the 2<sup>nd</sup> Inter-

Korean summit, Nampo was one of the two places earmarked for future shipbuilding hub. According to the results of the quantitative findings, investment from small and large SMEs is likely to be similar with the majority of small SME investing between US\$1-9 million while large SMEs will invest between US\$10-99 million. Nampo is likely to comprise of investors from the electronics industry investing between US\$1-99 million and the minerals industry investing between US\$1-9 million.

Some 32.6% of the respondents picked Sinuiju as the next potential location with investment a majority of investment between US\$1-9 million. As mentioned in Chapter 2, Sinuiju is an active cross-border trade city with Dandong in China. Chinese traders sell a range of goods from electronic equipment to stainless steel goods while DPRK merchant trade agricultural, textile and clothing. According to Marquand (2005), Sinuiju possesses relatively good infrastructure for ocean, railway and road transportation. There are gold, silver and coal mines near Sinuiju which provides the city with an advantage for outsourcing of raw materials to nearby Chinese cities in the Liaoning province. In Sinuiju, smaller SMEs will play a greater role with investment between US\$1-9 million. The main industries interested will be companies from the electronics, minerals and basic metals sector.

The other potential locations are Pyongyang, Wonsan and Rajin-Sonbong. Pyongyang and Wonsan are likely to attract small SMEs who are willing to invest less than US\$1million while large SMEs will form the majority of investors in Rajin-Sonbong. These cities could be integrated into the developmental plans under different scenarios discussed in RQ1, especially in the peaceful reunification scenario.

### **9.5 RQ3 – Transport Infrastructure Priorities for DPRK**

The major objective in this study was to ascertain the transport infrastructure and logistics development priorities for DPRK from the perspectives of experts and investors.

Experts and investors share the same view that road access should be the top priority for investment in infrastructure. DPRK's road network consists of four main routes. The first major route connects Kaesong-Pyongyang-Sinuiju. This provides added incentives to investors who wish to invest in Sinuiju to transport their products back to the South via this route. Similarly, companies in the Kaesong Industrial Complex are able to rely on suppliers based in Sinuiju or Pyongyang. The second arterial road links Nampo to Wonsan. Exports to Japan are able to use this route to transport their goods through the port of Wonsan. Nampo is the most important port in DPRK, and road accessibility to the ports should be a major priority.

Experts and investors differ in their opinions regarding the next infrastructure priority. Experts view railways as the next priority while investors choose maritime mode, with 37.5 per cent of them planning to use maritime modes to transport their goods out of Nampo. This could be explained through theoretical and practical aspects of transport planning. Railways have been frequently advocated in the literature and in the ROK government as the main focus of infrastructure due to historical links. This is supported through the view of Bulychev (2006) who emphasised the importance of rail projects to DPRK which will gradually help establish the state to be an important connecting transport hub. Experts view the connection of the TKR as an important missing

link that will translate into costs savings for cargoes originating from Busan to Europe (Ahn 2002). However, this idea might be too simplistic as it requires enormous investment into the upgrading and double-tracking of railway lines in DPRK. In addition, the different gauges used in countries will also complicate the transport process. In contrast, the views of investors seem to differ because besides using road transport for shipping to ROK and China, their export-oriented goods would be destined for destinations in Europe, USA and Japan which are mostly accessible only by maritime transport. Hence, maritime ports will be expected to play crucial roles in the transportation of goods.

#### **9.6 RQ4 - Managerial skills for DPRK managers**

Analysing the results of the qualitative questionnaire, experts' opinions on the need for acquiring knowledge and skills in economics, finance and commercial practices are in agreement with the literature and exploratory study. In Chapter 2, several changes to DPRK's economic management system were discussed. Part of the changes include enhanced autonomy of factories and enterprises, the introduction of competition and other economic notions include financial and monetary economies, price control mechanism as well as intellectual market goods. The results of the exploratory study also suggested that DPRK managers should gain experience in dealing in joint ventures and businesses with foreign companies.

New areas suggested by experts include engineering and information technology. DPRK will require managers with skills in civil engineering in the future as the country needs to rebuild its dilapidated infrastructure such as roads, railways and mines. According to one expert in the exploratory study,

DPRK has regularly sent managers overseas to countries in the former Russian bloc and China to learn and acquire more skills. Information technology is one area which DPRK has expertise in, especially in the area of animation. There is a huge computer centre dedicated to movie and cartoon animation and it regularly receives requests from film companies all over the world.

Some experts commented on the need for English language training. However, based on conversations with other experts who have been in DPRK, the locals possess very good linguistics ability. University students are required to undertake two major foreign languages such as Russian, English, Chinese and German.

#### **9.7 RQ5 - Main markets for DPRK-made products**

In the exploratory results, ROK, China and Europe were mentioned as possible destinations for DPRK-made products. The qualitative and quantitative surveys were used to ascertain the opinions of experts and potential investors. Both surveys confirmed the exploratory findings and literature that China and ROK would be the largest potential export destinations. In Chapter 2, it was mentioned that trade figures show that China and ROK are DPRK's largest trading partner. The findings of the quantitative survey also support the experts' opinions. Some 39.5 per cent and 28.7 per cent of the respondents choose China and ROK respectively as potential markets. Another 14.7 per cent of the respondents indicated Europe while 8.3 per cent choose Russia. Of products in the Kaesong Industrial Complex, it has been reported that all the products are shipped to ROK for sale or export to destinations in the EU, Russia and China (Nanto and Manyin 2011)

Some experts cited close proximity to export markets, large market size and economic concerns over the possible collapse of DPRK as possible reasons. China and ROK borders DPRK and exports are accessible through rail, road and water transport. Similarly, both countries have large populations which are able to support any exports from DPRK. Chinese merchants have been trading along the Chinese border cities of Liaoning and Jilin province for many years. As analysed and discussed earlier in RQ1, China and ROK are concerned about the economic impact of a collapsed-DPRK. Hence, in order to lower any potential unification costs and to prevent the economy from collapse, China and ROK have to continue to import DPRK-made products. This can be seen through the numerous economic projects (e.g. Kaesong Industrial Complex and Rajin transport projects) initiated by both countries. Companies exporting to China and ROK will most likely use road transport to export products from Nampo and Sinuiju.

#### **9.8 RQ6 – Industries which DPRK can focus in**

Experts and potential investors were asked about the type of products suitable for exports in order to ascertain the type of industries DPRK can focus in. At present, companies in the Kaesong Industrial Complex focus on textile, electronics, watch and clocks, cosmetics, and electrical parts (Nanto and Manyin 2011).

Experts expressed several opinions on the types of products suitable for export. They agree that DPRK should focus on light industry, such as apparel/textile, kitchenware, watch and bags, similar to those commission-on-process products in the KIC. DPRK has the potential to build up a viable assembly industry so

that it can feed its population by providing jobs for its people. This can be seen in the SEZs along the coastal regions in China where many factories are located focusing on labour intensive industries. Raw materials such as minerals, gold, iron ore, coal, and manganese are also potential products mentioned by experts. As mentioned earlier in Chapter 3, DPRK possesses many natural resources which are currently untapped due to its poor infrastructure. Seafood products will also potentially attract buyers in ROK and Japan.

SMEs indicated 'minerals/ore', 'electronics', and 'basic metals' as the top three industries that they will invest in. As mentioned in previous sections, minerals/ores and electronics form the core industries for potential investment. DPRK can also focus on basic metal products such as aluminium which has been processed from minerals/ores. Appendix X provides a table showing the size of investment corresponding to the potential industries and locations. A majority of the investors who indicated interest in investing in the above three industries is likely to commit US\$1-9 million dollars to set up factories in either Nampo or Sinuiju.

### **9.9 RQ 7 - Factors which influence location choices of ROK SMEs and logistics companies**

Chapter 4 introduced the concept of location theory and factors which are linked to international location decisions. One of the objectives of this study was to ascertain the factors which determine the location decisions of potential ROK investors. In the SMEs' questionnaire, respondents were asked to ascertain the relative importance of the 58 factors. From the descriptive statistics of the results, potential investors view *economic*, *infrastructure* and *spatial* factors as crucial in determining their location factors. Bhatnagar and Sohal (2005) also



found infrastructure to be most crucial factor. However, their findings on spatial factors show that it is not an important consideration for companies. 'Road access' (mean = 4.67) was the highest factor with 'SEZs' (mean = 4.58) and 'good supply of cheap land' (mean = 4.55) as the next most crucial factors.

In order to reduce the data and enhance the effectiveness of the results, a decision was made to conduct a factor analysis. The principal component analysis revealed four factors which have been named as '*legal*', '*political economy*', '*spatial*' and '*infrastructure*'. As there are no previous studies that can be compared with, these factors will be explained by their composition. The next chapter will propose policy guidelines for governments and companies on how to apply these factors when investing in DPRK.

'Legal' refers to the regulatory environment in DPRK which is susceptible to frequent and sudden changes. Investors are concerned that new regulations as well as labour and tax laws are not implemented suddenly. They were concerned that income taxes for foreign employees should be low. It is important for the ROK government and companies to ensure that DPRK gives assurances that sudden changes do not occur.

'Political economy' has implications for the business environment in DPRK. Potential investors view the importance of potential reunification as having an impact on DPRK embarking on reforms leading to a market economy which will lead to local and regional development. Having witnessed several SEZs such as Kaesong and Kumgangsan, the investors view the importance of having SEZs in place in Nampo and Sinuiju in DPRK which are not laden with excessive bureaucracy and corruption. Another issue which concerns investors

is the currency exchange risk depending on the status of the country and also the level of currency restrictions which control the amount of money which investors can take out of the country.

‘Spatial’ refers to the supply chain network of both upstream and downstream activities. Investors are concerned about the availability of raw materials, which is either sourced locally or in nearby countries to keep total costs low. The availability of natural resources is important to investors in industries such as basic metals and electronics. However, the infrastructure in most of the DPRK mines is primitive in nature which requires extensive investment. Another area of importance is the availability of major suppliers in the first and second tier which provides immediate parts for the final assembly or production. Downstream activities refer to the export destinations. Investors are concerned about the access to domestic markets as well as access to neighbouring markets in China and Japan.

‘Infrastructure’ issues include the accessibility of different types of transportation modes. Analysis confirmed that road and rail access are the two most important transport modes that need to be rehabilitated to provide a smooth distribution system for factories located in areas such as Nampo and Sinuiju. As mentioned in the literature, an H-shaped transport network has been suggested for road and rail access with four corners with Nampo and Sinuiju located in the east coast and Rajin-Sonbong and Wonsan located in the west (Kim et al 2006). As discussed in RQ3, investors regard maritime ports as an important transport mode which will be used for exports to countries such as Thailand and Singapore, both of whom have foreign trade with DPRK (Ahn 2002). Nampo on

the east coast has been redeveloped with modern container terminal berths while Wonsan on the west coast is a potential port for exports to Japan.

#### **9.10 RQ 8 - Types of logistics services/concepts to be introduced in DPRK**

In the logistics companies' questionnaire, respondents were asked about their logistics operations in DPRK. From the results, this study is able to determine previous logistics service requirements and ascertain future services required. However, only 24 per cent of the respondents indicated that they had operated '*previously*' in NK while the rest had not operated in DPRK before. Although this analysis is insufficient to reveal any conclusive results of the type of services needed, it is indicative. Appendix XIII shows the results of the scope of logistics companies' in DPRK. From the analysis of the results, the most likely services will be freight forwarding and warehousing with areas of concentration in Nampo and Sinuiju.

#### **9.11 Summary of Findings**

This chapter discussed and analysed the main findings of this research by triangulating the results of the qualitative research, the quantitative survey with the results of the exploratory study.

Three scenarios – status quo, collapse and reunification, were developed with each depicting the likely transport strategies and developments. The status quo scenario will most likely continue for the next five to eight years unless one of the wildcard situations, such as the death of Kim Jong-il occurs, which might result in uncertainty and instability in the region. Further research is necessary

to continue the scenario analysis dependent on the political and economic climate in DPRK and the interests of stakeholders.

Nampo and Sinuiju have been identified as the top two potential investments. Nampo is an important maritime gateway for DPRK where a majority of the imports and exports passes through the port. The place can be further developed with a cluster of agglomerated industries concentrated on electronic and minerals. SMEs have indicated a willingness to invest between US\$1-99 million in Nampo. Sinuiju was previously earmarked as a SEZ by the DPRK government but the plans were soon abandoned after the appointment of the administrative minister did not please the Chinese government. Sinuiju is an active trading hub between merchants in DPRK and China. The city can further develop its minerals industry as there are many mines around the region. This will tie in with China's plans to develop the North-east region around Liaoning and Jilin provinces.

Road transport was identified as the top priority for transport development in DPRK. Road networks can be developed around the Nampo and Sinuiju transport network to take advantage of the potential investment in the electronic and mineral industries. Rail transport is the next investment priority. Due to the difficulties in reconstructing the rail tracks, huge investments are needed to convert the tracks from single-line to double-line. However, it has been reported that railway tracks around some of the mines are already double-track.

DPRK managers can begin to acquire skills and knowledge in the areas of economic and finance. Countries such as the UK, China, Singapore and Switzerland have regularly invited the DPRK government to send students and

officials abroad to study in their universities. DPRK has seen a change in its economic policy with younger managers given more authority and autonomy to make productive decisions.

It was concluded that the main export markets will still be China and ROK with some exports to Russia and Europe. China and ROK have a strong interest to sustain DPRK to prevent a sudden collapse which would create chaos along the border regions. The main industries to focus on will be electronics and minerals. DPRK can take advantage of the extensive labour pool to create light industry assembly plants or mining sites.

Four factors influence the location choices of potential ROK investors. They are concerned about the legal risk in DPRK. As laws are susceptible to sudden changes, they would like more protection of their assets. The investors also view the political and economic environment as important, particularly the potential for reunification resulting in local and regional development and market economy. The level of bureaucracy and risk of corruption will also affect their investment decisions. The availability of raw materials and suppliers also concern potential investors. As mentioned earlier, the investors view access to road and railways as important.

Warehousing and freight forwarding are the top two logistics services requested by companies who have prior investment in DPRK. Further research could be conducted into case studies of different companies and mapping out their supply chains to gain further insights into the types of logistics services and skills required in DPRK.

The next and final chapter provides theoretical and practical advice for governments and companies on how to make use of the above findings in order to implement policies. It also discusses theoretical implications for the literature on DPRK as well as further research.

## **CHAPTER 10 - CONCLUSION**

The previous chapter contextualised the findings of this study by triangulating the results of the exploratory study with the qualitative interviews and the quantitative survey to answer the eight sub-research questions. This concluding chapter will provide a summary to this study by evaluating the main research objectives and question. It will also summarise the theoretical implications for academia and policy implications for government and business organisations through emphasising the contributions this research has made to the literature on DPRK, in particular transport and logistics. Lastly, this chapter will seek to address the main limitations of this study and provide suggestions for future research.

### **10.1 Evaluation of Research Objectives and Main Research Question**

The primary aim of this study was to gain new insights into the development of DPRK in the context of the political and economic impacts on the potential scenarios of DPRK, which will affect potential investors' decision to invest in DPRK. This in turn, will have implications on the types of transport and logistics strategies within the country. Table 10.1 presents an overview of how this research dealt with the respective research objectives.

Research objective	Addressed as follows
To analyse the political and economic factors affecting DPRK.	Chapter 2 examined the political economy of North Korea, with focus on the Juche ideology and efforts to reform the country with SEZs and currency controls. In addition, the present political and economic factors surrounding DPRK were analysed in the exploratory and qualitative research phase.
To appraise the present conditions of transport and logistics infrastructure in DPRK	Chapter 3 described the current conditions of transport and logistics infrastructure in DPRK. The results of the primary research emphasise the importance of access to road and rail.
To propose scenarios surrounding development in DPRK	Chapter 4 proposed several scenarios of DPRK which were extended during the qualitative research phase where experts were asked to comment on three scenarios. The primary research identified 'status quo' as the most likely scenario for the next five to eight years.
To evaluate the factors affecting potential investors' location choices to develop transport and logistics strategies	Chapter 4 identified several location theories and factors which affect international location decisions and ranked their importance following the results of the quantitative survey. The primary research also evaluated transport and logistics strategies.

**Table 10.1: Main research objectives and how they were addressed by this study**

The central research question to this research was to ascertain the implications of ROK SMEs' and logistics companies' location decisions and their impact on developing potential transport and logistics policies and strategies in DPRK. Due to the DPRK's unique and reclusive nature, this study had to first establish the most probable scenarios that will occur in DPRK through qualitative interviews with experts as any data published by DPRK or even ROK is not deemed reliable. Quantitative surveys were conducted concurrently on SMEs and logistics companies to ascertain the potential location decisions, level of investment, types of industries to focus and factors that will determine location decisions.



Several implications can be inferred from the analysis of this study. Firstly, companies are most likely to invest \$1-9 million dollars in DPRK, which implies that investment is likely to be small in the initial stages. Next, two potential locations for investments – Nampo and Sinuiju, were identified. Nampo would potentially attract 30 SMEs while 16 SMEs indicated preference for Sinuiju. Thirdly, the electronics and minerals industry would potentially spearhead investment into DPRK. Fourthly, China and ROK would form the main export markets for DPRK-made products. Lastly, road transport is the most preferred transport mode when exporting goods out of DPRK, with water transport coming next.

In the process of planning for transport and logistics strategies in DPRK, it would be useful to take into account the findings of this study. Strategies could possibly focus on developing the road transport network around Nampo and Sinuiju to support the development of cluster industries around the area. In addition, the transport network leading to the mines would also have to be upgraded to take advantage of the underdeveloped mining industry.

## **10.2 Theoretical Implications**

This thesis provides various theoretical implications relating to the study into DPRK.

All published research into DPRK is either qualitative (Harvie, 1992; Herold, 1996; Lee, 2000) or quantitative (Meade, 1997; and Lee and Deok, 2004) in nature. Moreover typically only secondary data is used due to the lack of reliable data. This study overcame the limitations by collecting primary data through a triangulation of qualitative and quantitative approaches on the views

of potential SMEs and logistics companies who have expressed interest in investing and have had previous logistical operations in DPRK. This new approach provides useful references for future research into DPRK to use a triangulation approach comparing the views of DPRK experts and practitioners.

A vast majority of the literature on DPRK tends to focus only on the political and economic aspects of the country (Lee, 1996; Noland, 2000; Park 2005). There is limited literature focusing on transport and logistics – Kim et al (2001) and Ducruet (2008) being exceptions. This study collected primary data through qualitative and quantitative research on the opinions of DPRK experts, SMEs and logistics companies on the types of industries to invest in, the main export markets for DPRK-made products and the types of transport mode used in transporting the finished products. Further research can be conducted into other SMEs and possible multinational companies.

Many research studies into the scenarios of DPRK limited their focus to political and/or economics issues (Nautilus Institute, 2003; Park, 2003; Lankov, 2008; and Stares and Wit, 2009). This study is the first to incorporate transport and logistics strategies into the scenarios of DPRK. The exploratory study confirms the existence of three basic scenarios – status quo, collapse and reunification. Under each strategy, various transport and logistics strategies were recommended.

Location theory has been applied in research on emerging economies such as China and Vietnam (Liu et al, 1999; Zhou et al. 2002; and Kawai, 2009). However, limited research has been conducted into ROK FDI – only two research papers were found (Kimura and Lee, 1998 and Kang and Lee, 2004),

of which both used secondary data. This study is the first study to use primary research to investigate ROK FDI location choices. It also developed a set of location factors, which are unique to a country like DPRK.

### **10.3 Policy Implications for Governments and Business Organisations**

The previous section discussed some theoretical implications and described the main contribution of this study to existing literature. This section adds value to the practical aspects of this research by presenting the policy implications for governments and business organisations.

This study revealed that road transport should be given priority over rail transport. Historically, the ROK government has placed importance on rail transport, preferring to connect the TKR. However, the results of the findings showed that investors place a higher importance on road access over rail access. The UN has conducted several studies into the feasibility of rehabilitating road transport. The ROK government should understand the perspective of potential investors to use road transport to export their products and place a priority on this mode when conducting talks with DPRK.

This study also revealed that potential investors regard Nampo and Sinuiju as places for investment. In the status quo scenario, it is unlikely that Nampo will be allowed to be developed into a SEZ as it is located near Pyongyang. SEZs are normally located a distance away from Pyongyang, e.g. Kaesong and Rajin-Sobong. However, there are investment opportunities for transport and logistics companies in Nampo as DPRK looks to expand the container port. On the contrary, there is a great potential to once again develop Sinuiju as SEZ. The

Chinese government wants to develop its North-east regions and will see it as an excellent opportunity to use Sinuiju just as it is using Rajin-Sobong in the north.

This study also revealed that companies in the electronics and minerals/ore industry will provide the majority of investment in DPRK. Governments and companies can be encouraged to form joint ventures with local DPRK companies to provide funding and technological expertise, especially in the area of mining. Companies in the electronics industry can set up assembly plants in light industries to take advantage of the inexpensive labour and land, similar to what is happening in the Kaesong Industrial Complex.

DPRK managers need to be more exposed to various skills and knowledge, especially in engineering and transport. The findings of the exploratory study revealed that DPRK students and managers have traditionally gone overseas to study finance and economics in Universities in China, Singapore and parts of Eastern Europe. Further knowledge and skills can be developed into engineering, agriculture, commercial practices and public policy.

#### **10.4 Limitations of the Study**

Although the findings of this thesis contribute to the existing knowledge on DPRK and provide managerial implications for companies, caution should be taken in applying the suggested proposals because of the limitations of the study.

This study employed a cross-sectional research design. Therefore, the findings of the qualitative and quantitative research relates to the 2007 time period.

Unfortunately, this study did not employ a longitudinal approach (i.e. investigating any changes in the importance of location choices by studying the phenomenon over a couple of years). As a consequence, the cross-sectional nature of the data may not reflect the changes in any opinions of the experts or potential investors. However, a longitudinal study presents practical difficulties as managers in companies might not be contactable over prolonged time periods and the system environment may change fundamentally to deny comparability.

The decision to use only ROK SMEs in the quantitative survey was based on the fact that the Kaesong Industrial Complex has been established since 2004 and there are many SMEs who have indicated their interests to invest in DPRK. However, the focus on only ROK SMEs limits the generalizability of the findings.

Another limitation of this research stems from the small sample size in the qualitative research and the low response rates in the quantitative surveys. The small sample size can be attributed to the number of experts who specialise in DPRK, and even smaller number with expertise in transport and logistics. The reasons for the low response rates were the lack of time of CEOs/managers, corporate policy of not filling in any questionnaires and lack of interest in the research project. This resulted in limited use of statistical techniques. Therefore, only descriptive and less powerful non-parametric tests were appropriate. However, statistically significant findings did emerge.

## 10.5 Implications for Further Research

In view of the above implications and limitations of this study, the following suggestions for further research are proposed:

- Examining the factors which influence the location choices of Chinese and non-Korean SMEs: This study revealed the factors which influence ROK SMEs and logistics companies' location choices. In order to deepen our understanding and provide a comparison, further research could concentrate on Chinese and foreign SMEs. Given the increased statistical population, such work would benefit from an increase in sample size.
- Using other research designs (e.g. case studies/Delphi method): This study used a qualitative and quantitative approach which only revealed the existence of certain phenomena but cannot fully explain them. Therefore prospective researchers might use case studies or the Delphi method to overcome some of the limitations of this research. Case studies into industries and companies will reveal the supply chains of their products which provide in-depth information on the types of transport and logistics services required. The Delphi method allows for in-depth fact finding and this could be applicable to developing future scenarios of DPRK.
- Applying more advanced statistical techniques: By extending the research into other non-Korean SMEs, the generalizability of findings and sample size will increase. Hence more advanced statistical techniques could be used to understand the relationship between location factors.

- Re-examining social and organisational factors: This study did not find high importance attached to a common culture and language on the location factors of SMEs and logistics companies. Organisational factors such as modern logistics providers and good logistics linkages did not rate highly. Further research could be conducted in the form of personal interviews with managers to explore their perceptions further.

## **10.6 Summary**

This study sought to study DPRK from a transport and logistics perspective. The current transport and logistics infrastructure was appraised. The development of scenarios of DPRK incorporated transport and logistics strategies based on each scenario type. The findings also used a mixed-methods approach to contribute to the existing literature on DPRK, which has been either qualitative or quantitative in nature. This study also applied a multi-disciplinary approach using location theory to understand ROK enterprises' choices regarding location factors.

Besides contributing theoretically to the existing literature on DPRK, this thesis provides practical implications for governments and companies identifying areas of investment opportunities and policies to adopt when dealing with DPRK.

In summary the major contributions of this thesis are that it offers a novel study to:

- incorporate transport and logistics aspects into developing scenarios of DPRK.

- incorporate a triangulation approach to studying DPRK.
- examine the factors which affect the location choices of ROK enterprises.

This study is an initial step in the study of DPRK. Further research is needed to understand more fully the transport and logistics strategies needed to develop DPRK into a potential transit hub in Northeast Asia, connecting Asia to Europe.



## **Appendices**

## Appendix I: Summary of Factors Influencing Location Choices

<b>Factors</b>	<b>Authors</b>
Access to distribution channels	Karakaya and Stahl (1989)
Administrative efficiency and transparency	Bhatnagar and Sohal (2005)
Agglomeration economies	Herrin and Pernia (1987); Urata and Kawai (2000); Zhang (2001); Cheng and Stough (2006) Li and Park (2006); Hong and Chin(2007); Kawai (2009)
Attractive living environment for managers	Herrin and Pernia (1987);
Availability of energy	Bhatnagar and Sohal (2005)
Availability of Free Trade Zones	Zhang (2001); Oum and Park (2004); Kawai (2009)
Availability of industrial sites	MacCarthy and Atthirawong (2003);
Availability of land	Oum and Park (2004); Bhatnagar and Sohal (2005)
Availability of raw materials	Blair and Premus (1987); Karakaya and Stahl (1989); Jungthirapanich and Benjaming (1995)
Availability of skilled labour	Herrin and Pernia (1987); Zhang (2001); MacCarthy and Atthirawong (2003); Oum and Park (2004); Urata and Kawai (2000); Bhatnagar and Sohal (2005); Cheng and Stough (2006); Hong (2007); Hong and Chin(2007)
Availability of suppliers	MacCarthy and Atthirawong (2003); Bhatnagar and Sohal (2005)
Availability of transport and telecommunications	Herrin and Pernia (1987); Jungthirapanich and Benjaming (1995); Urata and Kawai (2000); Zhang (2001); Asiedu (2002); MacCarthy and Atthirawong (2003); Oum and Park (2004); Cheng and Stough (2006); Li and Park (2006); Bhatnagar and Sohal (2005); Hong (2007); Hong and Chin(2007); Kawai (2009)
Competitive financial sector	Oum and Park (2004);
Cost of business services	Bhatnagar and Sohal (2005)
Cost of energy	Bhatnagar and Sohal (2005); Cheng and Stough (2006)
Cost of labour	Herrin and Pernia (1987); Urata and Kawai (2000); Zhang (2001); Asiedu (2002); Oum and Park (2004); Cheng and Stough (2006)

	Kawai (2009)
Cost of land	Herrin and Pernia (1987); Jungthirapanich and Benjaming (1995); MacCarthy and Atthirawong (2003); Bhatnagar and Sohal (2005); Cheng and Stough (2006)
Cost of transport infrastructure	Blair and Premus (1987); De Noble and Galbraith (1992); Bhatnagar and Sohal (2005)
Cultural, norms, language	Zhang (2001); MacCarthy and Atthirawong (2003)
Exchange rate volatility	Urata and Kawai (2000)
Flexible immigration	Oum and Park (2004)
Housing, schools, quality of life	Herrin and Pernia (1987); Jungthirapanich and Benjaming (1995); MacCarthy and Atthirawong (2003); Oum and Park (2004)
Key competitors' location	Bhatnagar and Sohal (2005)
Legal system	MacCarthy and Atthirawong (2003); Li and Park (2006)
Level of corruption	Aidis (2005)
Level of government support	Zhang (2001); Oum and Park (2004); Bhatnagar and Sohal (2005)
Modern logistics providers	Oum and Park (2004)
Openness of host country	Asiedu (2002); Zhang (2001)
Personal income taxes for foreign employees	Oum and Park (2004)
Political stability	Asiedu (2002); MacCarthy and Atthirawong (2003); Oum and Park (2004)
Presence of supporting government agencies	Bhatnagar and Sohal (2005)
Protection of foreign investment	Bhatnagar and Sohal (2005)
Proximity to market	Jungthirapanich and Benjaming (1995); MacCarthy and Atthirawong (2003); Oum and Park (2004); Bhatnagar and Sohal (2005)
Proximity to suppliers	Bhatnagar and Sohal (2005)
Purchasing power of local markets	Jungthirapanich and Benjaming (1995)
Purchasing power of locals	Aidis (2005)
Reliable electrical power and water supply	Herrin and Pernia (1987); Jungthirapanich and Benjaming (1995); MacCarthy and Atthirawong (2003)
Size of market	Zhang (2001); MacCarthy and Atthirawong (2003); Oum and Park (2004); Bhatnagar and Sohal (2005); Cheng and Stough (2006); Hong (2007); Hong and Chin(2007);

	Kawai (2009)
Stability of fiscal policies	Herrin and Pernia (1987); MacCarthy and Atthirawong (2003); Bhatnagar and Sohal (2005)
Stability of government policies	Urata and Kawai (2000); Bhatnagar and Sohal (2005); Cheng and Stough (2006); Li and Park (2006); Hong (2007)
Stability of market conditions	MacCarthy and Atthirawong (2003); Bhatnagar and Sohal (2005)
Stability of tax policies	Herrin and Pernia (1987); Jungthirapanich and Benjamining (1995); Asiedu (2002); MacCarthy and Atthirawong (2003); Oum and Park (2004); Aidis (2005); Bhatnagar and Sohal (2005)

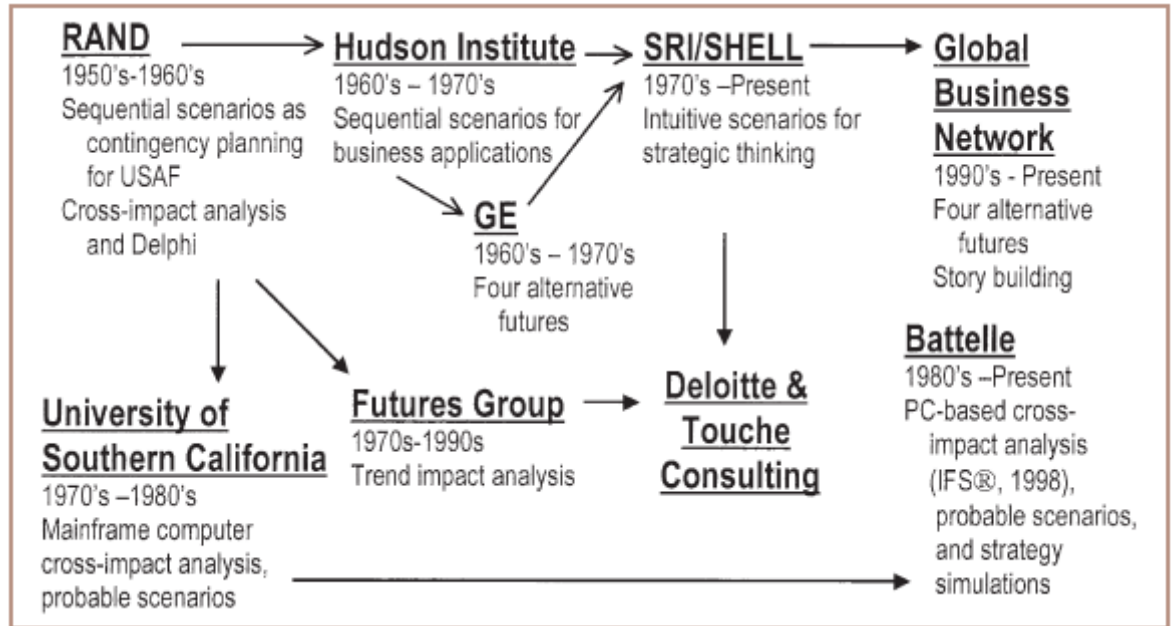
## **Appendix II: Overview of Scenario Approach**

Scenario planning has its origins in the military in the 1950s where Herman Kahn developed war-planning scenarios at the RAND Corporation and later around the 1960s in an institute which he founded, The Hudson Institute. His work is well documented (Pearman 1988 and Zentner 1982)) and his book “The Year 2000” published in 1967 is often quoted (Kahn and Wiener 1967). In that publication, scenarios were defined ((1967, 24) as

“A hypothetical sequence of events constructed for the purpose of focusing attention on causal processes and decision points.”

After Herman Kahn, scenarios have been used as a business planning tool since the early 1970s. Scenarios became popular as a strategic methodology through Pierre Wack’s description of the Shell scenarios used during the 1970s and 1980s (Wack 1985 and Cornelius et al. 2005). Since then, many schools of thoughts and methods of scenario planning have been developed (Godet 1987; Postma and Liebl 2005; Ringland 1998; Schwartz 1991 and van der Heijden 1996) and their history has been well documented (Bradfield et al. 2005 and Stead and Banister 2003). Figure II.a depicts the history of business scenarios.

**Figure II.a: The History of Business Scenarios**



Source: Millett (2003, 17)

This section will provide definitions of scenarios and scenario planning. Thereafter it will examine the different approaches and methods to classify the different scenario types. It will discuss the processes of scenario construction before concluding.

## II.i Scenario Definitions

The Oxford English Dictionary provides a number of definitions that point to the use of the word toward the 'story' end of the spectrum:

“Scenario is a description of an imagined situation or a postulated sequence of events; an outline of intended course of action; a scientific description or speculative model intended to account for observable facts.”

According to Ayers (1969), scenarios are logical and plausible set of events, both serial and simultaneous which means that the scenario building process

involves more than one picture of what might happen. Stead and Banister (2003), define a scenario as a tool that describes pictures of the future world within a specific framework and under specified assumptions. Millett (2003) further describes scenarios as a tool to emphasise the uncertainty surrounding the business environment and the different ways it could evolve. Ringland (2006, 4) defined scenario planning as dealing with future events/situations which are uncertain:

“That part of strategic planning that relates to the tools and technologies for managing the uncertainties of the future”

Scenarios and forecasting are not alike. Porter (1985, 17) defines a scenario as:

“An internally consistent view of what the future might turn out to be – not a forecast, but one possible future outcome.”

Pearman (1988, 74) further differentiates scenarios from forecasting and enlarges its role beyond corporate planning to include transport planning:

“Scenarios do not constitute a forecast, either collectively or individually. Rather, as a set their aim is in some sense to span the range of futures which might reasonably be expected to occur, and hence to provide a broad-ranging background against which policy assessment can be undertaken.”

Schnaars (1987) depicts scenario analysis to be a highly qualitative procedure using Delphi technique and Cross-Impact analysis. Ratcliffe's (2002) work seems to be in agreement as he analysed the historical context where the

popularity of qualitative methods such as structure and unstructured interviewing emerged. However, Jenkins (1997), points out the use of quantitative methods through mathematical programmes to select plausible alternate futures for scenario development. Berkhout and Hertin (2002, 40) balance both viewpoints by advocating the use of both methods in scenario planning:

“Quantitative information was used as a way of synthesising and illustrating the qualitative content of the scenarios.”

Policy scenarios allow the role and effect of different policies and proposals to be studied across a range of possible futures. May (1982) identifies a number of potential benefits of policy scenarios to decision-making, including:

- Providing useful frameworks for decision-making – scenarios allow decision-making issues to be explored using a range of alternative scenarios, reflecting different assumptions about the future;
- Identifying dangers and opportunities – considering a range alternative futures increases the likelihood of identifying possible problems and opportunities in policy-making;
- Suggesting a variety of possible approaches – the use of scenarios may generate a range of approaches to tackle issues or problems whereas the use of forecasts, based on single theories or simple extrapolations, often lead to the pursuit of singular solutions;
- Helping to assess alternative policies and actions – scenarios may for example be used to identify the usefulness of different policies under alternative future conditions;



- Increasing creativity and choice in decision-making – identifying possible future developments and avoiding the acceptance of current trends as inevitable opens up new possibilities for policy development.

Rotmans et al. (2000) concluded that many of the definitions of scenarios share some of the following characteristics:

- Scenarios are hypothetical, describing possible future pathways;
- Scenarios describe dynamic processes, representing sequences of events over a period of time;
- Scenarios consists of states, driving forces, events, consequences and actions which are causally related; and
- Scenarios start from an initial state (usually the present), depicting a final state at a fixed time horizon.

Nijkamp and Blass (1994, 82) differentiated the role of scenario and other techniques in transport planning:

“It is one of the methods and techniques of perspective policy research that have become very popular since the late sixties. Especially in the case of unstructured decision problems with uncertain outcomes, scenario analysis may be an appropriate instrument. It does not only contain a description of one or more future situations, but also a description of a consistent series of events that may connect the present situation with a described future situation (s).”

There are several advantages in using scenarios. Zwier et al. (1994) provides a summary below.

**Table II.a: Advantages of Using Scenarios**

<b>From:</b>	<b>To:</b>
- Focus on quantified variables	- Focus on qualitative pictures
- More emphasis on details	- More emphasis on trends
- Results determined by status quo	- Results based on future images
- From present to future	- From future to present
- Deterministic analysis	- Creative thinking
- Closed future	- Open future
- Statistical-econometric tests	- Plausible reasoning
- From simple to complex	- From complex to simple
- From quantitative to qualitative	- From qualitative to quantitative
- Single track thinking	- Multi-track thinking
- Reactive problem driven	- Proactive vision driven
- Multiple implicit assumptions	- Transparent simple assumptions
- Limited set of options	- Open range of options
- Model-determined mind	- Alertness to signals of uncertainty

Source: Zwier et al. (1994)

Through researching the future by recognising the warning signs and the drama that is unfolding, one can avoid surprises, adapt and act effectively. Ultimately, the end result of scenario planning is not a more accurate picture of tomorrow but better decisions about the future (Schwartz 1991).

## **II.ii Historical Perspective**

Since Kahn and Wiener developed scenario writing about 50-60 years ago, different schools of thoughts and approaches on scenario analysis have emerged and drive scenario planning techniques among academics and practitioners today. Ringland (2006) describes the following set of organisations dealing with scenarios:

- STRATX – MARKSTRAT3 (computer simulation);
- Battelle Institute (BASICS/IFS);
- The European Commission – “Shaping Factors – Shaping Actors”;
- The French School (Godet approach: MICMAC);
- The Futures Group (Fundamental Planning Method);
- Generon Consulting;
- Global Business Network (Schwartz’s approach – scenario checklist);
- International Futures’ (Terra computer model);
- SAMI Consulting;
- SCMI (Systems thinking, Future-open thinking and Strategic Thinking);
- Stanford Research Institute (SRI); and
- The Arlington Institute (Wildcards and Trends);

Stead and Banister (2003) identified three approaches in scenario planning – American, French and Swedish approach while Bradfield et al. (2005) provided a comprehensive review of the two main geographical centres in the development of scenario techniques - American and French.

The American approach follows on Kahn and Wiener and is practice in many business organisations such as SRI (Mandel and Wilson 1993 and Ralston and Wilson 2006), Global Business Network (Schwartz 1991) and Shell (Cornelius et al. 2005 and Schoemaker and van der Heijden 1992), which is known as the 'Intuitive Logics' school. According to Gausemeier et al. (1998), the scenarios, which are qualitative in nature, are based on scenario logics, where are organised themes, principles, or assumptions that provide each scenario with a coherent, consistent, and plausible logical underpinning. The intuitive approach assumes that business decisions are based on a complex set of relationships among economic, political, technological, social, resource and environmental factors. These factors provide insights and help improve decision making in all business areas. Huss and Honton (1987) mentioned two other methodologies within this school of scenario planning – Trend-Impact Analysis (TIA) and Cross-Impact Analysis (CIA), which was developed by Olaf Helmer and Ted Gorden at the Rand Corporation. Both techniques are highly quantitative involving “probabilistic modified trends”. The TIA model was developed in the 1970s by the Futures group, evolving as a result of the inability of traditional forecasting techniques to consider the effects of unprecedented future events. The CIA model which was first developed as a forecasting game has been further developed and used elsewhere including Battelle Memorial Institute (IFS – Interactive Future Simulations), Centre for Futures Research (INTERAX – Interactive Cross-Impact Simulation) and SMIC (French acronym for Cross Impact Systems and Matrices).

The French school, La Prospective, was first developed by Gaston Berger in the 1950s at the same time when Khan was developing war-planning scenarios.

Bradfield et al. (2005) provides a comprehensive background. At that time, Berger was concerned with the long-term political and social future of France. The primary objective was to (Bradfield et al. 2005, 802):

“Formulate an acceptable scenario-based methodology for developing positive images or ‘normative scenarios’ of the future and to lead these images into the political arena where they could serve, as a guiding vision to policy makers and the nation, providing a basis for action”

In 1970s, Michel Godet, then head of the Department of Future Studies at SEMA Consulting Group, began to use scenario planning for several French national institutions. He developed several computer programme tools based on mathematics to build scenarios. Some of his tools include – morphological analysis for scenario building; MICMAC for identifying key variables; MACTOR to analyse actor’s strategies and SMIC-Prob-Expert to determine the feasibility of scenarios. Although Godet (2001) argues that his methods stand apart because of its use of mixed systems analysis tools and procedures, it is largely an amalgamation of the intuitive logics and probabilistic modified trend methodologies.

Bradfield et al. (2005) points out that the main difference lies in the intended target audience. The early USA approach tended to be of a global nature whereas in France it was narrowly focused on a national level. However, as scenario planning evolved, it is now widely used in business as a strategy tool (Ringland 2006 and Schwartz 1991).

The last school of thought – the Swedish approach, mainly discussed and used by Stead and Banister (2003) has been little mentioned in other literature although it has been used twice for policy analysis in Sweden (Johansson et al. 1983 and Olson 1994). Based on a variant of the French approach, this approach is normative in structure and uses a backcasting approach (discussed in more detailed in the next section) based on a selection of desirable futures or choices.

### **II.iii Scenario Types and Techniques**

It appears from literature that there is little common consensus on the types of scenarios present today as seen from McDowall and Eames's (2006) classification which is dissimilar with Nijkamp et al. (1998) and Rotman's et al. (2000) and that of Masini and Vasquez (2000). McDowall and Eames's include forecasting and backcasting under descriptive scenarios while both Rotman's et al. and Nijkamp's et al work listed forecasting and backcasting as separate categories. However, there are some general categories which scenarios are broadly classified. Based on a majority of the literature (Nijkamp et al. 1998 and Rotmans et al. 2000), scenarios can be classified into the following categories:

- Descriptive vs. Normative scenarios;
- Projective vs. Prospective scenarios;
- Quantitative vs. Qualitative scenarios;
- Common-sense oriented/Participatory vs. Expert-based scenarios; and
- Trend, Reference or Knowledge-based scenarios

Descriptive or exploratory scenarios start from past and present trends and lead to likely futures irrespective of their (un)desirability. Exploratory scenarios emphasise drivers and do not specify a predetermined desirable end state towards which storylines must progress (McDowall and Eames 2006). Normative or anticipatory scenarios are built on alternative visions of the future that are desired. According to Nijkamp et al. (1998), normative scenarios may be constructed by applying norms and values of the authors and also by means of surveying and asking people to provide normative information.

Projective or forecasting scenarios are forward directed where future pictures are based on current situation and exploring future consequences (Schwartz 1991). McDowall and Eames (2006) explain forecasting as using quantitative extrapolation and modelling to predict likely futures from current trends. Prospective scenarios based on backcasting starts with pre-determined targets and objectives constructed through external opinions, then pathways leading from the current trends to the 'end point's are investigated.

Quantitative scenarios involve the use of computer programs and mathematical modelling, similar to the 'La Prospective' French approach while qualitative scenarios are based on narratives, used in SRI and GBN. Narrative scenarios are useful in situations where data is weak or missing.

Common-sense oriented or participatory scenarios build on the opinions of various stakeholders like decision makers, business people and public to generate new futures from such views and opinions. Participatory scenarios are getting more popular as it provides richness to the scenarios from stakeholders with different knowledge and expertise. Expert-based scenarios are constructed

through the opinions of experts in a certain field, i.e. transport or climate, who are assumed to be able to assess realistic and creative pictures of the future without being constrained by current wisdom (Nijkamp et al. 1998).

Scenarios may be classified as trend, reference and knowledge scenarios. Trend scenarios may describe the impacts and the final picture of current policies and trends (Nijkamp et al. 1998). It uses intuitive analysis by surveying experts. Reference scenarios provide extreme pictures of the future by analysing extreme developments and policies. It serves as a guide reference framework for less extreme scenarios to guide policy choices. Knowledge scenarios have higher credibility as it gathers opinions using scientific insights since it may be assumed that scientists may have the best insights into future developments (Nijkamp et al. 1998). Some of the common methods used include surveying, organising workshops and Delphi methods.

There exist two other types of classification explained by van Notten et al. (2003) and Börjeson et al. (2006). Van Notten et al. (2003) divided their scenario typology into three themes (Table II.b) – “why” (project goal), “how” (process design) and “what” (scenario content). The first theme addresses the project’s goals and objectives – either exploration or decision-support. Under decision-support, scenarios propose strategic options for policy makers. “Process design” deals with the scenario techniques such as the use of quantitative (*La Prospective* school) or qualitative data (*Intuitive Logic* school). “Scenario content” looks at the details of the developed scenarios describing the variables and dynamics inside each scenario. The variables refer to actors, factors and sectors (Rotmans et al. 2000) and dynamics are events and processes that make up the story in each scenario.



**Table II.b: The Scenario Typology**

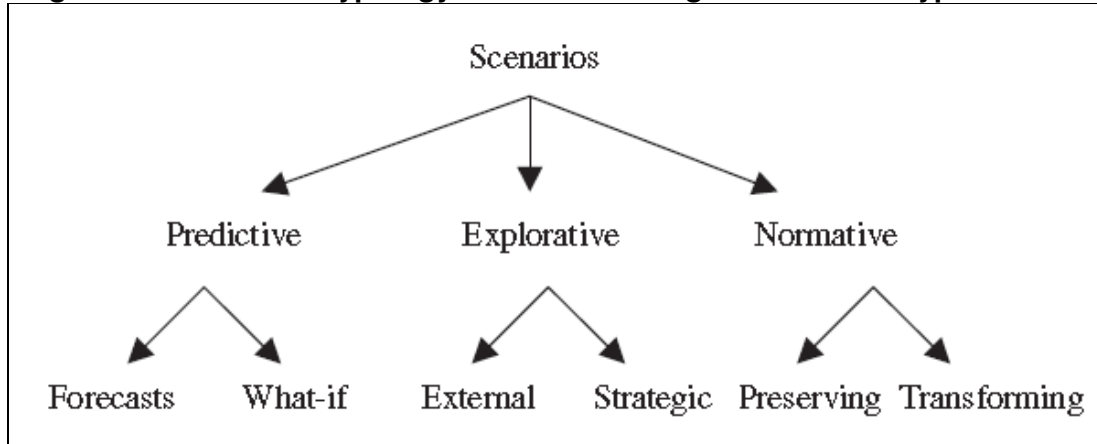
<i>Overarching themes</i>		<i>Scenario</i>	<i>characteristics</i>
A	Project goal: exploration vs decision support	I.	Inclusion of norms? : descriptive vs normative
		II.	Vantage point: forecasting vs backcasting
		III.	Subject: issue-based, area-based, institution-based
		IV.	Time scale: long term vs short term
		V.	Spatial scale: global/supranational vs national/local
B	Process design: intuitive vs formal	VI.	Data: qualitative vs quantitative
		VII.	Method of data collection: participatory vs desk research
		VIII.	Resources: extensive vs limited
		IX.	Institutional conditions: open vs constrained
C	Scenario content: complex vs simple	X.	Temporal nature: claim vs snapshot
		XI.	Variables: heterogeneous vs homogenous
		XII.	Dynamics: peripheral vs trend
		XIII.	Level of deviation: alternative vs conventional
		XIV.	Level of integration: high vs low

Source: van Notten et al. (2003, 426)

Börjeson et al. (2006) developed their classification based on several principal questions – ‘What will happen?’, ‘What can happen?’ and ‘How can a specific target be reached?’ (Figure II.b). The first question is dealt with by ‘*Predictive scenarios*’ which consists of two different types – Forecasts and ‘*What if*’ scenarios. Forecasts deals with what will happen when the most likely development unfolds while ‘*What if*’ scenarios responds to what will happen on the condition of some specified events?. The second category – explorative scenarios aims to explore from different perspectives, situations that are regarded as possible to happen. External factors focus on factors beyond the control of relevant actors while strategic scenarios focus on internal factors. The last category – normative scenarios focuses on how future targets or objectives can be met. *Preserving scenarios* can be done either quantitatively (modelling) or qualitatively (surveys) to find out how certain targets can be efficiently met.

Transforming scenarios, which essentially uses backcasting, works from a high-level and highly prioritised starting point.

**Figure II.b: Scenario Typology with Three Categories and Six Types**



Source: Börjeson et al. (2006, 725)

Based on their scenario classification, Börjeson et al. (2006) identified various methods for each scenario type under three main headings – ‘generating’, ‘integrating’ and ‘consistency’ (Table II.c). As a way of generating ideas and gather data, surveys, workshops and Delphi technique are the most common methods. The next step in ‘integrating’ all the data together, the authors suggest using mathematical modelling methods such as time series analysis, explanatory modelling and optimising modelling. This is possible where data is available and can be quantifiable. However, in the case of DPRK where the accuracy of the data cannot be verified, modelling methods is not appropriate. Lastly, to check the consistency of the scenarios, morphological field analysis or cross-impact analysis methods have been suggested. Morphological analysis is applicable to exploratory scenario-building, areas of innovation and R&D. It is used to check the internal consistency of qualitatively determined scenarios.

**Table II.c: Contribution of Techniques in Scenario Development**

Scenario types	Techniques		
	Generating	Integrating	Consistency
<i>Predictive</i>			
Forecasts	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Workshops</li> <li>• Original Delphi method</li> </ul>	<ul style="list-style-type: none"> <li>• Time series analysis</li> <li>• Explanatory modelling</li> <li>• Optimising modeling</li> </ul>	
What-if	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Workshops</li> <li>• Delphi methods</li> </ul>	<ul style="list-style-type: none"> <li>• Explanatory modelling</li> <li>• Optimising modeling</li> </ul>	
<i>Explorative</i>			
External	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Workshops</li> <li>• Delphi modified</li> </ul>	<ul style="list-style-type: none"> <li>• Explanatory modelling</li> <li>• Optimising modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Morphological field analysis</li> <li>• Cross impact</li> </ul>
Strategic	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Workshops</li> <li>• Delphi methods</li> </ul>	<ul style="list-style-type: none"> <li>• Explanatory modelling</li> <li>• Optimising modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Morphological field analysis</li> </ul>
<i>Normative</i>			
Preserving	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Workshops</li> </ul>	<ul style="list-style-type: none"> <li>• Optimising modeling</li> </ul>	<ul style="list-style-type: none"> <li>• Morphological field analysis</li> </ul>
Transforming	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Workshops</li> <li>• Backcasting Delphi</li> </ul>		<ul style="list-style-type: none"> <li>• Morphological field analysis</li> </ul>

Source: Börjeson et al. (2006, 731)

Van't Klooster and van Asselt (2006) advocate the use of a qualitative scenario-axes technique, which has been widely used by Schwartz (1991) and Van der Heijden (1996) as it is a useful and straightforward tool to construct images of the future in a coherent and systematic way. This technique, applicable to long term national planning, selects two most important driving forces after using the Delphi method to reach a consensus. One of the drawbacks of this method is the restriction of driving forces as there might be more than two driving forces available.

Bishop et al. (2007) identified eight general categories of scenario techniques with two to three variations of each type, resulting in more than twenty techniques overall.

1. Judgement (genius forecasting, visualisation, role playing, Coates and Jarratt);
2. Baseline (trend extrapolation, Manoa, systems scenarios, trend impact analysis);
3. Elaboration of fixed scenarios (incasting, SRI);
4. Event sequences (probability trees, sociovision, divergence mapping);
5. Backcasting (horizon mission methodology, impact of Future Technologies, future mapping);
6. Dimensions of uncertainty (morphological analysis, field anomaly relaxation, GBN, MORPHOL, OS/SE);
7. Cross-Impact Analysis (SMIC-Prob-Expert, IFS); and
8. Modelling (trend-impact analysis, sensitivity analysis, dynamic scenarios)

## **Appendix III: Research Methods for Business Researchers**

### **III.i Introduction**

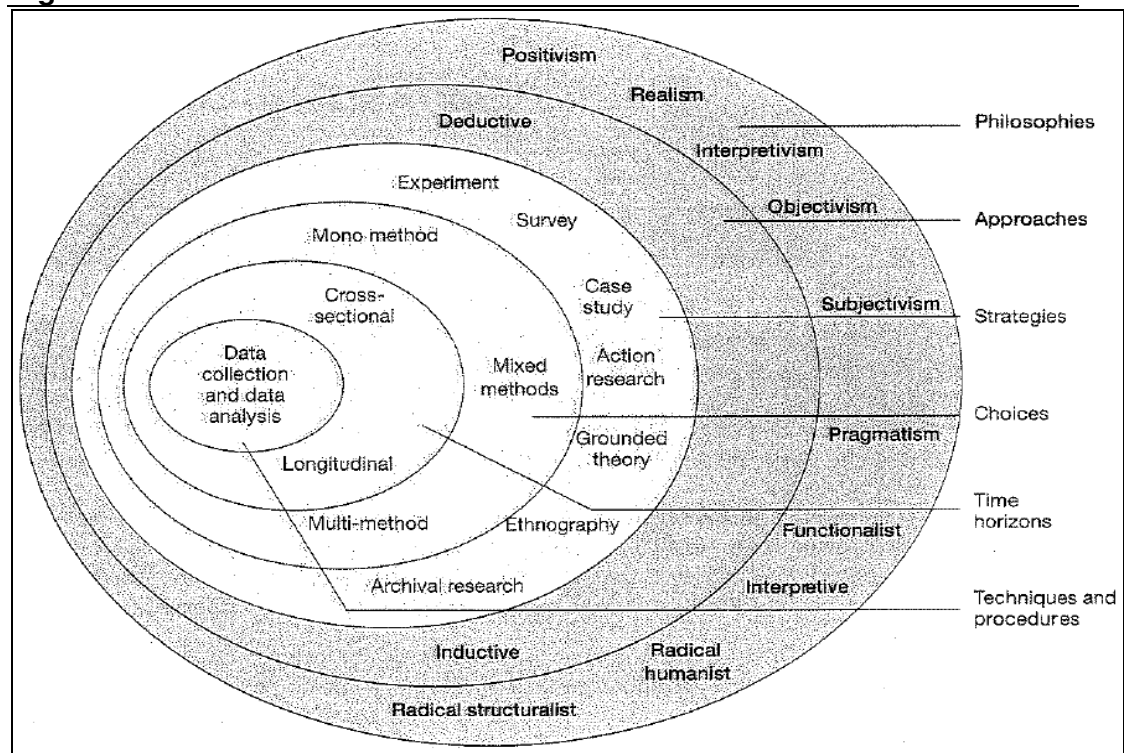
Reviewing the literature on business and social research methods may lead to confusion when one faces key terms such as philosophies, paradigms, methodologies and research designs. Very often terms are used interchangeably without any clear direction and definition to their meanings while classifications differ from one source to another. Bryman (2007) uses the term 'research strategy' in order to describe 'qualitative and 'quantitative' research while Saunders et al. (2007) describes 'experiment', 'case study', 'action research' or 'grounded theory' using the same term. Confusion arises when one compares different classifications of 'epistemological' and 'ontological' consideration. Saunders et al. (2007) lists 'positivism', 'realism' and 'phenomenology' under 'epistemology of science' and 'objectivism', 'social constructionism' under 'ontology of science'. In contrast, Easterby-Smith et al. (2008) lists 'social constructionism' under 'social sciences epistemologies'. Amongst literature, there is general consensus on two most commonly known paradigms – 'positivistic or quantitative' and 'phenomenological or qualitative' (Collis and Hussey 2003 and Remenyi et al. 1998). In light of the circumstance where various authors focus on a number of issues when describing the research methodologies, one preferred source has been adopted without ignoring the insights of others. For the purpose of this research, the illustration by Saunders et al. (2007) was adopted as it provides a comprehensive model which reflects the various issues of the research process as layers of an onion (Figure 6.1). They argue that there are five important layers of research. One has to understand the research philosophy and the various approaches to

research before dealing with the selection of appropriate data collection methods.

### III.ii Research Philosophies

A research philosophy reflects the way one thinks about the development of knowledge and is usually associated with the term ‘paradigm’ which in turn ‘refers to the progress of scientific practice based on people’s philosophies and assumptions about the world and the nature of knowledge; in this context, about how research should be conducted’ (Collis and Hussey 2003, 46).

**Figure III.a: The Research Onion**



Source: Saunders et al. (2007, 102)

In Figure III.a, Saunders et al. (2007) classified the philosophies into three main headings – epistemology, ontology and axiology. *Epistemology* concerns the question of what is (or should be) regarded as acceptable knowledge in a discipline and asks about the relationship between the researcher and subject

of research (Bryman and Bell, 2007). There are three positions under this knowledge of science – *positivism*, *realism* and *interpretivism* (or *phenomenology*). Positivists see the researcher as independent from that being researched whereas phenomenologists consider that the research interacts with what is being research (Collis and Hussey 2003).

*Ontological* philosophy is concerned with the nature of social entities and reality and the question as to whether the world is socially constructed and can only be understood by examining the perceptions of the human actors, or whether the world is objective and external to the researcher. There are three aspects of ontology – objectivism, subjectivism and pragmatism. Objectivism portrays the position that social entities exists in reality external to social actors. Subjectivism or constructionism asserts that social phenomena are continually created from the perceptions and consequent actions of social actors. Pragmatism argues that the most important determinant of the research philosophy adopted is the research question. If the research questions do not suggest that a positivist or interpretivist philosophy is adopted, pragmatists take the view that mixed methods, both quantitative and qualitative, can be employed.

*Axiological* philosophy studies judgments about values. It's the researcher's own values which play an important role in all stages of the research process that is crucial for the research results to be credible. Heron (1996) argues that our values are the guiding reason of all human action. He furthers argues that researchers demonstrate axiological skill by being able to articulate their values as a basis for making judgements about what research they are conducting and how they go about doing it.

### **III.iii Research Approaches**

The second layer of the research process onion deals with two different research approaches - the deductive and inductive approach. The former approach tends to develop theory and hypotheses and designs research strategies to test the hypotheses while the latter is guided by collecting data and developing theory. Although both approaches are each linked to the different research philosophies, labelling them would not add any practical value but may be potentially misleading (Saunders et al. 2007).

Saunders et al. (2007) list various characteristics of the deductive approach which may be relevant to work in DPRK:

- The search to explain causal relationships between variables;
- Controls to allow the testing of hypotheses;
- The need for a highly structured methodology in order to ensure reliability;
- The need to operationalise concepts to measure facts quantitatively;
- The need to reduce problems to the simplest possible elements in order to understand better as a whole; and
- Adhere to the principle of generalisation

The inductive approach is often regarded as building theory. The most famous inductive example is known as 'grounded theory' developed by Glaser and Strauss (1967) in the medical field and expanded by other researchers in many other disciplines. Grounded theory enters the fieldwork phase without a hypothesis and therefore gives preference to the subject, data, and field under



study rather than theoretical assumptions. The inductive approach is less rigid than the deductive approach and is able to provide new insights and explanations in the areas researched. However, it is more time consuming and poses the risks that no useful data patterns and theory emerges.

The question arises as to which approach should be adopted for work in DPRK. Saunders et al. (2007) advocates the combination of deduction and induction approaches within the same research as it is often advantageous to do so.

### **III.iv Research Strategies**

A research strategy is a general plan of how the researcher is going to answer the research questions. Before deciding on the strategies, it is important to establish the purpose(s) of the research. There are three categories – (a) *exploratory studies* (b) *descriptive studies* and (c) *explanatory studies*. Exploratory studies are conducted to clarify and define the nature of a problem. It is useful when finding out ‘what is happening; to seek new insights; to ask questions and to assess phenomena in a new light’ (Robson, 2002, p. 59). There are four principal ways of conducting exploratory research – literature search; interviewing ‘experts’ in the subject; focus groups and delphi technique. Descriptive studies seek to describe the characteristics of a population or a phenomenon (Zikmund, 2003). They are an extension of previous exploratory research, using a type of structured interview such as questionnaire surveys. Explanatory research, also known as causal research, is conducted to ‘identify cause-and-effect relationships among variables’ (Zikmund, 2003, p. 56). The emphasis is to study a situation or a problem in order to explain the

relationships between variables. Quantitatively, variables will be subjected to statistical tests such as correlation.

Saunders et al. (2007) list the following seven strategies in the research 'onion':

- Experiment: it is a form of research that is traditionally linked to natural sciences, although it is widely use in social sciences such as psychology. The purpose of experiment is to study causal links, similar to explanatory research. The use of experiment allows investigation of changes in one variable, while manipulating one or two other variables. It is linked to a positivist paradigm and a deductive approach which may be inappropriate working in DPRK.
- Survey: a popular and common strategy in business and management research owing to the advantage of collecting a large number of data from a sizable population in a highly economical way and to have control over the research process. It is normally used in exploratory and descriptive research. Questionnaires, structured observations and structure interviews are most common data collection techniques in this category. Surveys are often linked to a positivist paradigm and a deductive approach, and may be suited to explore stakeholder attitudes to development in DPRK.
- Case study: involves in-depth investigation of a phenomenon to test theories, explore the 'ground', offer new insights or suggest new variables (Tan, 2007). It is valuable in answering 'who', 'why' and 'how' questions to gain a rich understanding of the context of the research. A variety of data collection methods include interviews, observations, documentary analysis and

questionnaires. It is useful in generating theories thus it can be seen as an inductive approach.

- Action research: involves evaluating and collecting data on an ongoing situation/problem, formulating hypotheses based on the data collected, taking action by altering selecting variables and evaluating the results of the actions by collecting more data. The purpose of action research is to find an effective way of bringing about a conscious change in a partly controlled environment, which may not exist in DPRK.
- Ethnography: is classified under the inductive approach. The purpose is to describe and explain the social worlds the research subject inhabits in the way in which they would describe and explain it (Saunders et al. 2007, p. 142). However this research is not commonly used in business research and access issues may be prohibitive in DPRK.
- Archival research: makes use of administrative records and documents as the principal source of data. This strategy can be applied to exploratory, descriptive or explanatory research and allows research questions which focus upon the past and changes over time to be answered (Saunders et al., 2007, 143). It is important to determine the type of data available and to design research to make the most of it, as this may be useful in DPRK.

Remenyi et al. (1998) suggested three further techniques which are applicable to business and management research.

- Forecasting: associated with mathematical and statistical techniques of regression and time-series analysis. This technique allows projections to be made on past or historical data. It is highly quantitative in nature and aims to establish relationships between different sets of historical data. This technique is positivist in nature but the research results can be interpreted in an interpretivist way so that it is able to be integrated into business and management research, although data availability in DPRK may be an issue.
- Futures research: provides a way of considering and developing predictions. This research is in forward looking using scenario projects and Delphi technique. It involves obtaining expert opinions towards a common group consensus. This research tactic would not generally be sufficient on its own as the main focus for a PhD, but it could be used to support other techniques in attempt to triangulate and validate conclusions (Remenyi et al., 1998, 54).
- Scenario research: involves collecting evidence from a group of experts who are asked to discuss the implications of one or several hypothetical situation occurring. The comments would be processed and stories/scenarios would be developed.

### **III.v Triangulation/Mixed Methods**

Saunders et al. (2007) listed three choices when it comes to choosing data collection techniques and data analysis procedures. *Mono-methods* refer to using a single data collection technique and corresponding analysis procedures. E.g. using qualitative procedure to analyse in-depth interviews. *Multiple-methods* refers to the combinations where more than one data collection

technique is used with associated analysis techniques but restricted within either a quantitative or qualitative world view (Tashakkori and Teddlie, 1998). E.g. multi-method quantitative study can be conducted through questionnaires and structured observations and using statistical procedures to analyse the data. *Mixed methods* studies are those that combine the qualitative and quantitative approaches into the research methodology of a single study or multi-phased study (Tashakkori and Teddlie, 1998, 17). There are two strands of research under this method – *mixed-methods research* and *mixed-model research*. Mixed-methods research can be conducted at the same time (parallel) or one after another (sequential). Mixed-model research takes quantitative data and qualitates it and vice-versa. Another commonly used term for mixed methods is 'triangulation' which is derived from the process used by surveyors and sailors measuring distances between objects by making observations from multiple locations to get a fix on its true location (Neuman, 2000). In terms of research, it refers to the use of multiple sources of data, different research methods and/or more than one researcher to investigate the same phenomenon in a study (Collis and Hussey, 2009, 85). Denzin's (1978) concept of triangulation involved combining data sources to study the same social phenomenon. The assumption in triangulation is that its effectiveness rests on the premise that the weaknesses in each single method will be compensated by the counterbalancing strengths of another (Amaratunga et al. 2002). According to Brewer and Hunter (1989), this multi-method strategy is simple, but powerful for each new set of data increases confidence that the research results reflect reality rather than methodological error. Mangan (2004) advocates the greater use of triangulation in logistics research as it provides multidimensional insights into many management research problems as is likely to be required working in

DPRK. Morse (2003, 198) provides eight combinations of triangulated designs (Table III.a)

**Table III.a: Notations and Designs for Mixed Methods Research**

<b>Designs Notations</b>	<b>Meanings</b>
QUAL + qual	<ul style="list-style-type: none"> <li>• qualitatively driven, qualitative simultaneous design</li> </ul>
QUAN + quan	<ul style="list-style-type: none"> <li>• quantitatively driven, quantitative simultaneous design</li> </ul>
QUAL + quan	<ul style="list-style-type: none"> <li>• qualitatively driven, qualitative and quantitative simultaneous design</li> </ul>
QUAN + qual	<ul style="list-style-type: none"> <li>• quantitatively driven, quantitative and qualitative simultaneous design</li> </ul>
QUAL → qual	<ul style="list-style-type: none"> <li>• qualitatively driven project, followed by a second qualitative project</li> </ul>
QUAN → quan	<ul style="list-style-type: none"> <li>• quantitatively driven project, followed by a second quantitative project</li> </ul>
QUAL → quan	<ul style="list-style-type: none"> <li>• qualitatively driven project, followed by a quantitative project</li> </ul>
QUAN → qual	<ul style="list-style-type: none"> <li>• quantitatively driven project, followed by a qualitative project</li> </ul>

Source: Morse (2003, 198)

Tashakkori and Teddlie (1998) and Creswell and Clark (2007) listed several benefits of mixed methods:

- Provides strengths that offset the weaknesses of both quantitative and qualitative research;
- Help answer questions and provides more comprehensive evidence for studying a research problem than either quantitative or qualitative research alone;
- Encourages the use of multiple paradigms rather than the typical association of certain paradigms;
- Mixed methods are 'practical' in the sense that the researcher is free to use all methods possible to address a research problem.

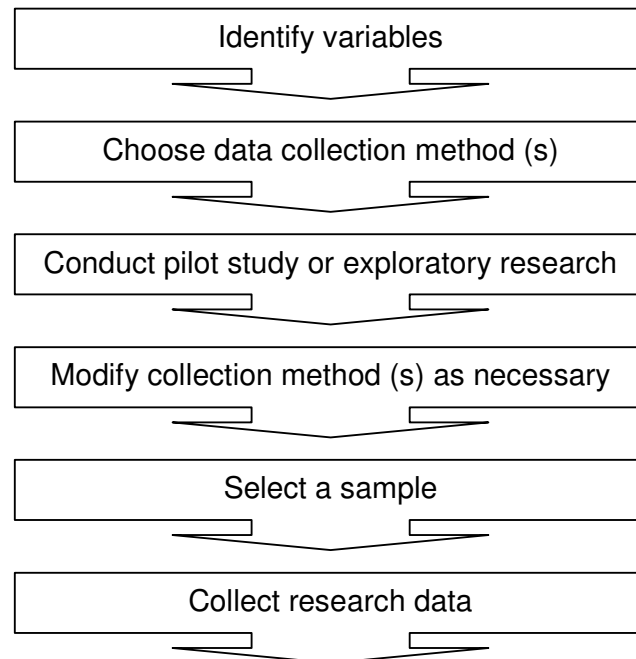
### **III.vi Time Horizons**

The time perspective to research design is an important issue. Research can be carried out using cross-sectional or longitudinal studies. The former takes a 'snapshot' of an ongoing situation or a particular phenomenon at a particular time while the latter conducts research over a long period of time. Cross-sectional studies are conducted when there are time constraints or limited resources. Quantitative methods (e.g. surveys) or qualitative strategies (unstructured interviews) can be used. Longitudinal research is appropriate when research questions and hypotheses are affected by how things vary over time (Hair Jr. et al., 2003). It investigates the dynamics of the problem by studying the same people or situation several times or continuously over a period of time. The choice between both time horizons lies in the sample size. Cross-sectional studies usually deal with a larger population while longitudinal research deals with only a few subjects. A mix of contemporary and future analysis will be required to analyse the potential for logistics development in DPRK.

### **III.vii Data Collection Methods**

After deciding upon the research philosophy and research approach to the study, as well as setting an appropriate research strategy and time horizon, the last layer of the research 'onion', which is also the core of the research process (i.e. data collection methods) is reached. Collis and Hussey (2009) present an overview of the data collection process (Figure III.b).

**Figure III.b Overview of the Data Collection Process**



Source: Collis and Hussey (2009, 188)

The most common primary data collection methods in social sciences are:

- Observations: involve the systematic observation, recording, description, analysis and interpretation of people's behaviour. The researcher can be involved as a participant or non-participant observer. Participant observation is qualitative and the researcher is fully involved in order to provide a detailed understanding of practices, values and motives of those being observed. Structured observation is quantitative in nature and is concerned with observing and recording the frequency of what people do in terms of their behaviour and actions. Observations can generate a lot of useful and valuable data. However, the problems of observation concerns ethics and observer bias. In DPRK access issues are prohibitive.



- Interviews: a method for collecting data in which selected participants are asked questions in order to find out what they feel, do, know or think. Interviews are classified into structure, semi-structure and unstructured or in-depth interviews. They can be carried out face-to-face, over telephone and increasingly over the internet. Using the internet is advantageous where the interviewees are geographically dispersed. In exploratory studies, in-depth interviews are helpful to gain new insights to a situation. In descriptive studies, structure interviews are used to identify general patterns. Semi-structure interviews are useful in causal studies to understand relationships between variables reveal in descriptive studies. Interviews can be challenging as it can be a time-consuming and expensive process. In addition, obtaining access to participants might pose potential problems. Data generated from interviewees are extensive but often invaluable. This method is appropriate to gleaning attitudes to development in DPRK.
- Questionnaires: a list of carefully structure questions, which have been chosen after considerable testing with a view to eliciting reliable responses from a particular group of people (Collis and Hussey, 2009, 191). The aim is to find out what they think, do, or feel because it will aid in answering our research questions. Questionnaires may be used in large-scale surveys as well as for studies with small sample sizes. Questionnaires are can be self-administered or interviewer-administered. Self-administered questionnaires are completed by respondents. Such questionnaires are administered electronically using the Internet, posted to respondents who return them by post after completion or delivered by hand to each respondent and collected later. Interviewer-administered questionnaires are conducted through

telephone (e.g. market research) or structured interviews. One of the main problems associated with questionnaires is the non-response bias (either questionnaire non-response or item non-response), but overall this strategy is likely to be relevant to DPRK.

### **III.viii Criteria in Business Research**

Saunders et al. (2007) emphasise that a sound research design is important in order to make the research findings as credible as possible. Bryman and Bell (2007, 40) stated that 'three of the most prominent criteria for the evaluation of business and management research are reliability, replication and validity'. These three criteria will be explained further below:

- *Reliability* is concerned with the question of whether the research findings can be repeated. In DPRK, this may be impossible as the external environment is changing so rapidly. Although reliability is usually linked with quantitative research, it applies for deductive approach (e.g. with the question, 'Will the measure yield the same results on different occasions?') as well as the inductive approach ('Will different researchers on different occasions make similar observations?'). The major threats to reliability issues are bias concerning the subject or the observer.
- *Replication* is close to the idea of reliability. At times, researchers might choose to replicate the process or findings of others. In order to make a study reliable, it has to be replicable. Therefore, a researcher must explain the research process in great detail in order to make the study replicable.

- *Validity* is concerned with the question of whether the research results accurately reflect what is really happening in the situation. It deals with the integrity of the results generated from the study. There are three main types of validity: measurement validity ('Can the observations and research findings be explained by the construct under investigation?'), internal validity ('How likely is it that the independent variable really influences the dependent variable to the extent the research findings suggest?') and external validity ('Can the results of the research be generalised beyond the specific research context?')

#### **Appendix IV Example of Covering Letter for Qualitative Survey**

Dear Prof. XXX,

Please allow me to introduce myself. My name is Kelvin Pang and I am a Singaporean doctorate researcher with the University of Plymouth, UK. My research interests focuses on political and economical developments in North Korea and also the impact of Korean unification on Northeast Asia.

I obtained your email address from AccessAsia website and understand that you have knowledge of North Korea. A crucial part of my research is conducting surveys with academics and industry experts in order to gain a wide spectrum of professional opinions, views and suggestions on issues pertaining to North Korea. These professional opinions, together with a future questionnaire survey, will be incorporated into a scenario planning model to develop composite strategies for North Korea.

For this reason, I would like to invite you to participate in this email interview. The names of all respondents and their organisations will remain confidential. If you are willing, I will send you the interview questions. If you would like a copy of the research findings, please let me know and I will send you a copy at the conclusion of the research.

My principal supervisor, Dr John Dinwoodie, is happy to confirm that this is a genuine request. He can be contacted by email at [john.dinwoodie@plymouth.ac.uk](mailto:john.dinwoodie@plymouth.ac.uk) or by telephone on (44) 01752 232446.

I look forward to hearing from you.

Yours faithfully,

Kelvin Pang  
Phd Researcher/Lecturer  
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## **Appendix V Qualitative Questionnaire for DPRK Experts**

Dear Prof. XXX,

Thank you for participating in this email interview.

Your opinions and views on questions addressing the following contexts (political, economic, infrastructure, managerial, spatial) are very much appreciated. Please record your answers in the spaces provided. Please feel free to provide any additional comments with regards to the research or the questions asked.

If you would like a copy of the research findings, please feel free to let me know and I will send you a copy at the conclusion of the research.

Yours sincerely,

Kelvin Pang  
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Drake Circus, Plymouth  
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Fax: +44(0) 1752 232249  
Email: [kelvin.pang@plymouth.ac.uk](mailto:kelvin.pang@plymouth.ac.uk)

## **Politics**

1. What are the main political issues currently surrounding North Korea
2. What are the interests/strategies of the respective countries towards North Korea? (i.e. USA, China, South Korea, Japan and Russia)
3. Several scenarios of North Korea have been suggested: (1) regime collapse from military coup (2) regime collapse from uprising of citizens (3) integration and peaceful unification and (4) status quo. Which scenario do you think is most likely to take place in the **next 5-7 years**? Please state your reason(s).
4. In your opinion, on a scale of one (very unlikely) to 5 (very likely), do you think that there will be a unified Korea within the next 30 years?

## **Economic**

1. In a status quo scenario, what sort of economic aid/incentives can North Korea expect from various countries (i.e. USA, China, South Korea, Japan and Russia)?
2. In a regime collapse scenario, what are the main economic priorities for North Korea in the short, medium and long term?
3. In a peaceful reunification scenario, what are the economic strategies needed to help North Korea?
4. What are the potential sources of financing for economic development projects in North Korea?

## **Infrastructure**

1. In a status quo scenario, who would finance the cost of rebuilding North Korea's infrastructure? (public, private)
2. In a regime collapse scenario, who would finance the cost of rebuilding North Korea's infrastructure? (public, private)
3. In a peaceful unification scenario, who would finance the cost of rebuilding North Korea's infrastructure? (public, private)

4. Please rank, from **one (highest priority) to seven (lowest priority)**, the main investment priorities for transport logistics infrastructure in North Korea?

- |  |        |
|--|--------|
| (a) Access to airports                   | (    ) |
| (b) Access to maritime ports             | (    ) |
| (c) Road access                          | (    ) |
| (d) Rail access                          | (    ) |
| (e) Supplies of energy and electricity   | (    ) |
| (f) Telecommunications infrastructure    | (    ) |
| (g) Logistics facilities e.g. warehouses | (    ) |

### **Managerial**

1. What are the three main areas/disciplines which North Korea can send their delegates overseas to gain essential knowledge?

### **Spatial**

1. Where are the main markets for North Korean-made products?
2. What are the main North Korea products suitable for export?

### **Miscellaneous**

- Are there any other important issues which you feel that has not mentioned?

**Thank you for your time!**

## Appendix VI Scope of ROK SMEs

Sector	SMEs		Small Businesses	Micro-enterprises
	No of Workers	Capital & Sales	No. of Workers	
Manufacturing	Less than 300	Capital worth \$8M or less	Less than 50	Less than 10
Mining, construction and transportation	Less than 300	Capital worth \$3M or less	Less than 50	Less than 10
Large general retail stores, hotel, recreational condominium operation, communications, information processing and other computer-related industries, engineering service, hospital and broadcasting	Less than 300	Sales worth \$40M or less	Less than 10	Less than 5
Seed and seedling production, fishing, electrical, gas and waterworks, medical and orthopedic products, wholesales, fuel and related products wholesales, mail order sale, door-to-door sale, tour agency, warehouses and transportation-related service, professional, science and technology service, business support service, movie, amusement and theme park operation	Less than 200	Sales worth \$20M or less	Less than 10	Less than 5
Wholesale and product intermediation, machinery equipment rent for industrial use, R&D for natural science, public performance, news provision, botanical garden, zoo and natural parks, waste water treatment, waste disposal and cleaning related service	Less than 100	Sales \$10M or less	Less than 10	Less than 5

Source: General Criteria (Article 2 of Framework Act on SMEs)



## Appendix VII – ROK SMEs Quantitative Survey

No.			
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### Kelvin Pang

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International Shipping and Logistics Group  
University of Plymouth School, CKY405  
Drake Circus, Plymouth, PL4 8AA  
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### INVESTMENT IN NORTH KOREA: A SURVEY OF LOCATION DECISIONS OF SOUTH KOREAN SMALL AND MEDIUM ENTERPRISES

Dear Sir/ Madam,

As part of my doctoral research, I am conducting a survey about the potential investment decisions of South Korean small and medium enterprises in North Korea in order to derive strategic and operational recommendations for North Korea.

Your reply will be treated in strict confidence and only be used for academic purposes. The names of individual respondents and their organisations will not be used in published materials or passed on to third parties. If you indicate, I will send you a summary of the survey results.

I look forward to hearing from you **within two weeks**. If you require any further details please do not hesitate to contact me at the email address listed.

Yours sincerely

Kelvin Pang

**Unless indicated otherwise, please tick one box to show your preferred response**

1. How many employees are there in your organisation?  
☐ <1-19   ☐ 20-49   ☐ 50-99   ☐ 100-199   ☐ 200-299   ☐ >300
2. Which industries is your organisation associated with?  
☐ Food processing   ☐ Textile   ☐ Paper/Pulp   ☐ Petroleum/Chemical  
☐ Machinery   ☐ Transportation/Equipment   ☐ Electrical/Electronics  
☐ I.T.  
☐ Minerals/Ore   ☐ Non-metal products   ☐ Basic metals   ☐ Agricultural  
☐ Hotel   ☐ I.T. service   ☐ Leisure (tourism/golf)   ☐ Finance  
☐ Other \_\_\_\_\_
3. What is the total annual revenue of your organisation?  
☐ <US\$5million   ☐ US\$5-10million   ☐ US\$10-20million   ☐ US\$20-40million   ☐ US\$>40million
4. List up to three main products which your organisation would produce in North Korea?  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_
5. Which type of industries will your organisation invest in North Korea? (Please select three)  
☐ Food processing   ☐ Textile   ☐ Paper/Pulp   ☐ Petroleum/Chemical  
☐ Machinery   ☐ Transportation/Equipment   ☐ Electrical/Electronics  
☐ I.T.  
☐ Minerals/Ore   ☐ Non-metal products   ☐ Basic metals   ☐ Agricultural  
☐ Hotel   ☐ I.T. service   ☐ Leisure (tourism/golf)   ☐ Finance  
☐ Others \_\_\_\_\_

6. What would be the size of your organisation's investment?
- ☐Up to US\$1 million   ☐Between US\$1-10 million  
☐Between US\$10-100 million   ☐Between US\$100 and 500 million  
☐Over US\$500 million
7. If your organisation plans to operate a factory in North Korea in the near future, where is the intended location to sell your products? (Please select up to two of the locations shown below)
- ☐South Korea   ☐China   ☐Japan   ☐Southeast Asia   ☐Southwest Asia  
☐Russia   ☐Europe (except Russia)   ☐Oceania   ☐U.S.   ☐Central America  
☐Canada   ☐South America
8. Which main mode of transport would your organisation use when exporting your goods out of North Korea?
- ☐Water transport   ☐Rail   ☐Road   ☐Air
9. If the North Korean government opens up other regions beside Gaesung, which location would your organisation consider the most promising for future investment?
- ☐Nampo   ☐Pyongyang   ☐Wonsan   ☐Sinuiju   ☐Cheongjin  
☐Najin-Sonbong   ☐Haeju   ☐Other region \_\_\_\_\_
10. Please rank the following factors, from **one (most important) to eight (least important)**, which you think is most important for the development of logistics and transport in North Korea?
- |                 |          |
|-----------------|----------|
| Political       | (      ) |
| Economics       | (      ) |
| Infrastructure  | (      ) |
| Legal           | (      ) |
| Managerial      | (      ) |
| Spatial/Markets | (      ) |
| Social          | (      ) |
| Organisational  | (      ) |

11. Consider the factors which influence your organisation's decision to locate investment in North Korea. Please *rate the importance of each factor shown below* in your location decision with (1) being least important to (5) great importance.

Factors	1	2	3	4	5
<b>Political/Government. When considering locating in North Korea, how important is it that:</b>					
government and officials support business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there is political stability, with the nuclear issue resolved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there is regional stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bureaucracy is not excessive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the risk of corruption is low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there is potential for unification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Economic. When considering locating in North Korea, how important is the presence of:</b>					
special economic zones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a competitive financial sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a clustering of common industries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good levels of local and regional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
reforms encouraging a market economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
low levels of exchange rate risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
few currency restrictions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
low costs of relocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a culture which encourages earning high profits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
an open market economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
few restrictions on trade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
low set-up costs for new local establishments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
state financial incentives (subsidies, loans, grants etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Infrastructure. When considering locating in North Korea, how important is good:</b>					
access to domestic markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
telephone and internet infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
supplies of energy and electricity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
supplies of water and sewage disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
logistics facilities e.g. warehouses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
access to an airport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
access to a maritime port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
road access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rail access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Legal. When considering locating in North Korea how important is it that:</b>					
immigration policies are flexible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
personal income taxes for foreign employees are low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
clear laws governing logistical practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
payment methods are flexible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
clear rules governing regulation and contracts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

labour and tax laws do not change suddenly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
new regulations are not suddenly imposed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Managerial. When considering locating in North Korea how important is it that managers in North Korea</b>					
have a good knowledge of logistics concepts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have had sufficient management experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have a good knowledge of management concepts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
are keen to accept new technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Spatial/Markets. When considering locating in North Korea how important is:</b>					
gaining a bridgehead into the North Korean market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a good supply of plentiful and cheap land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
close proximity to regional markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the promise of new markets for North Korean products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good availability of raw materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a lack of sizable markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good availability of natural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the limited purchasing power of local markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good access to markets in China and Japan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
proximity to major suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Social. When considering locating in North Korea how important is:</b>					
good housing, schools, environmental amenities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a pool of educated labour with requisite skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cultural affinity with other Koreans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a common culture and language	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good availability of industrial estates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a good supply of low labour cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Organisational. When considering locating in North Korea, how important are</b>					
plentiful modern logistics service providers and costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good logistics linkages and accessibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good logistics distribution system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Your personal details**

**Your position (or job):**

**How many years have you worked in this industry?**

☐ <1   ☐ 1-3   ☐ 4-5   ☐ 6-10   ☐ Over 10

**How many years you have worked in your present organisation?**

☐ <1   ☐ 1-3   ☐ 4-5   ☐ 6-10   ☐ Over 10

**Location:**

**Contact:**

**I would like to receive an executive summary of the results of the survey:**

☐ Yes   ☐ No

**Thank you for your time in completing this questionnaire!**

## Appendix VIII – ROK Logistics Companies Quantitative Survey

No.			
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### INVESTMENT IN NORTH KOREA: A SURVEY OF LOCATION DECISIONS OF SOUTH KOREAN LOGISTICS ENTERPRISES

Dear Sir/Madam,

As part of my doctoral research, I am performing a survey about the potential investment decisions of South Korean and Foreign Enterprises' in North Korea in order to derive strategic and operational recommendations for North Korea.

Your reply will be treated in strict confidence and only be used for academic purposes. The names of individual respondents and their organisations will not be used in published materials or passed on to third parties. If you like, I will send you a summary of the survey results with pleasure.

I look forward to hearing from you **within two weeks**. If you require any further details please do not hesitate to contact me at the email address listed.

Yours sincerely

Kelvin Pang

**Unless indicated otherwise, please tick one box to show your preferred response**

1. How many employees are there in your organisation?  
☐ 1-19   ☐ 20-49   ☐ 50-99   ☐ 100-199   ☐ 200-299   ☐ >300
2. How many years has your company been in the logistics industry?  
☐ <5   ☐ 6-10   ☐ 11-15   ☐ 16-20   ☐ Over 20
3. Which countries do you operate in other than South Korea? (Please list three)  
a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_
4. What is your total annual revenue last year?  
☐ <US\$5million   ☐ US\$5-10million   ☐ US\$10-20million   ☐ US\$20-40million   ☐ US\$>40million
5. What type of logistics services does your company provide? (please tick 3 only)  
☐ Warehousing   ☐ Freight forwarding   ☐ Customs clearance  
☐ Consulting services   ☐ Freight consolidation   ☐ Physical distribution  
☐ Break-bulk operations   ☐ Freight brokerage   ☐ Packing/Storage  
☐ Reverse logistics   ☐ Multi-modal   ☐ Customer service   ☐ Purchasing  
☐ Transport   ☐ Order processing
6. Which industries does your company serve? (Please tick as many as possible)  
☐ Food processing   ☐ Textile   ☐ Paper/Pulp   ☐ Petroleum/Chemical  
☐ Machinery   ☐ Transportation Equipment   ☐ /Electronics   ☐ I.T.  
☐ Minerals/Ore   ☐ Non-metal products   ☐ Basic metals   ☐ Agricultural  
☐ Hotel   ☐ I.T. service   ☐ Leisure (tourism/golf)   ☐ Finance  
☐ Other \_\_\_\_\_



7. Presently, does your company have any logistics/transport operations in North Korea?
- ☐ Yes (Please answer Question 8 and 9)
- ☐ Previously (Please answer Question 8 and 9)
- ☐ No (Please proceed to question 10)
8. Which part of North Korea did the logistics/transport operations cover?
- ☐ Nampo ☐ Pyongyang ☐ Wonsan ☐ Sinuiju ☐ Cheongjin
- ☐ Najin-Sonbong ☐ Haeju ☐ Other region \_\_\_\_\_
9. What was the volume of cargo transported? (t = tonnes)
- ☐ < 5000t ☐ 5000-10000t ☐ 10000-20000t ☐ 20000-40000t
- ☐ 40000-60000t ☐ >60000t
10. Please rank the following factors, from **one (most important) to eight (least important)**, which you think is most important for the development of logistics and transport in North Korea?
- Political ( )
- Economics ( )
- Infrastructure ( )
- Legal ( )
- Managerial ( )
- Spatial/Markets ( )
- Social ( )
- Organisational ( )

11. Consider the factors which influence your organisation's decision to locate investment in North Korea. Please *rate the importance of each factor shown below* in your location decision with (1) being least important to (5) great importance.

Factors	1	2	3	4	5
<b>Political/Government. When considering locating in North Korea, how important is it that:</b>					
government and officials support business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there is political stability, with the nuclear issue resolved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there is regional stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bureaucracy is not excessive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the risk of corruption is low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
there is potential for unification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Economic. When considering locating in North Korea, how important is the presence of:</b>					
special economic zones	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a competitive financial sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a clustering of common industries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good levels of local and regional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
reforms encouraging a market economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
low levels of exchange rate risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
few currency restrictions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
low costs of relocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a culture which encourages earning high profits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
an open market economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
few restrictions on trade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
low set-up costs for new local establishments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
state financial incentives (subsidies, loans, grants etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Infrastructure. When considering locating in North Korea, how important is good:</b>					
access to domestic markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
telephone and internet infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
supplies of energy and electricity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
supplies of water and sewage disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
logistics facilities e.g. warehouses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
access to an airport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
access to a maritime port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
road access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rail access	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Legal. When considering locating in North Korea how important is it that:</b>					
immigration policies are flexible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
personal income taxes for foreign employees are low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
clear laws governing logistical practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
payment methods are flexible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
clear rules governing regulation and contracts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
labour and tax laws do not change suddenly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
new regulations are not suddenly imposed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Managerial. When considering locating in North Korea how important is it that managers in North Korea</b>					
have a good knowledge of logistics concepts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have had sufficient management experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
have a good knowledge of management concepts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
are keen to accept new technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Spatial/Markets. When considering locating in North Korea how important is:</b>					
gaining a bridgehead into the North Korean market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a good supply of plentiful and cheap land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
close proximity to regional markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
the promise of new markets for North Korean products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good availability of raw materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a lack of sizable markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good availability of natural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

the limited purchasing power of local markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good access to markets in China and Japan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
proximity to major suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Social. When considering locating in North Korea how important is:</b>					
good housing, schools, environmental amenities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a pool of educated labour with requisite skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
cultural affinity with other Koreans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a common culture and language	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good availability of industrial estates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a good supply of low labour cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Organisational. When considering locating in North Korea, how important are</b>					
plentiful modern logistics service providers and costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good logistics linkages and accessibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
good logistics distribution system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Your personal details**

**Your position (or job):**

**How many years have you worked in this industry?**

☐ <1   ☐ 1-3   ☐ 4-5   ☐ 6-10   ☐ Over 10

**How many years you have worked in your present organisation?**

☐ <1   ☐ 1-3   ☐ 4-5   ☐ 6-10   ☐ Over 10

**Location:**

**Contact:**

**I would like to receive an executive summary of the results of the survey:**

☐ Yes   ☐ No

**Thank you for your time in completing this questionnaire!**

## Appendix IX – Size of SMEs' Investment in DPRK

Future investment	Size of investment	No. of employees		
		Small <sup>a</sup>	Large <sup>b</sup>	Total
Nampo	<\$1m	4	0	4
	\$1-9m	7	6	13
	\$10-99m	3	9	12
	\$100-499m	0	1	1
	<b>Total</b>	<b>14</b>	<b>16</b>	<b>30</b>
Pyongyang	<\$1m	6	0	6
	\$1-9m	4	2	6
	\$10-99m	0	0	0
	\$100-499m	0	0	0
	<b>Total</b>	<b>10</b>	<b>2</b>	<b>12</b>
Wonsan	<\$1m	1	3	4
	\$1-9m	0	0	0
	\$10-99m	0	0	0
	\$100-499m	0	0	0
	<b>Total</b>	<b>1</b>	<b>3</b>	<b>4</b>
Sinuiju	<\$1m	5	1	6
	\$1-9m	10	9	19
	\$10-99m	0	1	1
	\$100-499m	0	0	0
	<b>Total</b>	<b>15</b>	<b>11</b>	<b>26</b>
Najin-Sonbong	<\$1m	1	1	2
	\$1-9m	2	2	4
	\$10-99m	0	2	2
	\$100-499m	0	0	0
	<b>Total</b>	<b>3</b>	<b>5</b>	<b>8</b>

**Number of employees in SMEs indicating the size and location of potential investment**

a – less than 100 employees

b – more than 100 employees

## Appendix X – Size of Investment of Industries in Potential Locations

Future investment	Size of Investment	Textile	Machinery	Transportation Equipment	Electronics	I.T.	Minerals	Basic Metals	Total
<b>Nampo</b>	<\$1m	2	0	1	0	3	1	0	7
	\$1-9m	3	4	2	6	1	10	5	31
	\$10-99m	2	1	1	7	1	3	3	18
	<b>Total</b>	<b>7</b>	<b>5</b>	<b>4</b>	<b>13</b>	<b>5</b>	<b>14</b>	<b>8</b>	<b>56</b>
<b>Pyongyang</b>	<\$1m	1	0	0	3	3	3	2	12
	\$1-9m	4	1	1	1	1	3	1	12
	<b>Total</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>6</b>	<b>3</b>	<b>24</b>
<b>Wonsan</b>	<\$1m	0	0	0	2	0	2	2	6
	\$1-9m	0	1	2	0	0	0	0	3
	<b>Total</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>9</b>
<b>Sinuiju</b>	<\$1m	3	1	0	1	2	1	1	9
	\$1-9m	4	5	0	10	4	11	9	43
	\$10-99m	0	0	1	0	0	0	0	1
	<b>Total</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>11</b>	<b>6</b>	<b>12</b>	<b>10</b>	<b>53</b>
<b>Najin-Sonbong</b>	<\$1m	1	0	0	1	0	0	0	2
	\$1-9m	0	0	1	3	0	3	3	10
	\$10-99m	0	1	2	0	0	0	0	3
	<b>Total</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>15</b>

## Appendix XI – Export Destinations

Export Destination - China									
Investment Locations	Mode of Transport	Size of Investment	Industries						
			Textile	Machinery	Transport Equipment	Electronics	Minerals	Basic metals	I.T.
Nampo	Water	<\$1m	2	0	0	0	0	0	1
		\$1-9m	2	1	1	1	2	0	0
		\$10-99m	0	1	1	2	0	1	1
	Road	<\$1m	0	1	1	0	1	0	0
		\$1-9m	1	0	1	4	7	4	0
		\$10-99m	0	0	0	3	1	1	0
	<b>Total</b>		<b>5</b>	<b>3</b>	<b>4</b>	<b>10</b>	<b>11</b>	<b>6</b>	<b>1</b>
Pyongyang	Water	<\$1m	0	0	0	1	1	1	0
		\$1-9m	1	0	0	0	0	0	0
	Rail	<\$1m	0	0	0	1	0	0	0
	Road	<\$1m	1	0	0	1	1	0	1
		\$1-9m	2	1	1	1	3	1	0
	<b>Total</b>		<b>4</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>1</b>
Wonsan	Rail	<\$1m	0	0	0	1	0	0	0
	Road	\$1-9m	0	2	1	1	2	1	0
	<b>Total</b>		<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>0</b>

Export Destination - China									
Investment Locations	Mode of Transport	Size of Investment	Industries						
			Textile	Machinery	Transport Equipment	Electronics	Minerals	Basic metals	I.T.
Sinuiju	Water	\$1-9m	1	0	0	2	3	3	0
	Rail	<\$1m	0	0	0	0	0	1	1
		\$1-9m	0	0	0	1	1	1	0
		\$10-99m	0	0	0	0	0	3	0
	Road	<\$1m	3	0	0	0	1	0	0
		\$1-9m	1	0	0	4	3	0	0
		\$10-99m	0	1	1	0	0	0	0
	Total		5	1	1	7	8	8	1
Najin-Sonbong	Water	<\$1m	1	0	0	1	0	0	1
		\$1-9m	0	0	0	1	1	1	0
		\$10-99m	0	1	0	0	0	0	0
	Rail	\$10-99m	0	1	1	0	0	0	0
	Road	\$1-9m	0	1	1	1	1	1	0
	Total		1	3	2	3	2	2	0

Export Destination - South Korea									
Investment Locations	Mode of Transport	Size of Investment	Industries						
			Textile	Machinery	Transport Equipment	Electronics	Minerals	Basic metals	I.T.
Nampo	Water	<\$1m	2	0	0	0	0	0	1
		\$1-9m	2	1	0	1	0	0	0
		\$10-99m	0	0	0	1	0	0	0
	Road	<\$1m	0	0	1	0	1	0	1
		\$1-9m	0	1	1	3	5	3	0
		\$10-99m	1	0	0	1	1	1	0
	Total		5	2	2	6	7	4	2
Pyongyang	Water	<\$1m	0	0	0	1	1	1	0
		\$1-9m	1	0	0	0	0	0	0
	Rail	<\$1m	0	0	0	1	1	1	0
	Road	<\$1m	1	0	0	0	0	0	0
		\$1-9m	1	0	0	1	3	1	0
	Total		3	0	0	3	5	3	0
Wonsan	Water	\$1-9m	0	0	0	1	0	1	0
	Road	<\$1m	0	1	0	0	0	0	0
		\$1-9m	0	0	2	1	2	0	0
	Total		0	1	2	2	2	1	0



Export Destination - South Korea									
Investment Locations	Mode of Transport	Size of Investment	Industries						
			Textile	Machinery	Transport Equipment	Electronics	Minerals	Basic metals	I.T.
Sinuiju	Water	\$1-9m	1	0	0	3	0	0	0
	Rail	<\$1m	0	0	0	1	0	1	1
		\$1-9m	0	0	0	2	2	2	0
	Road	<\$1m	3	0	0	0	1	0	0
		\$1-9m	1	2	0	3	4	4	0
		\$10-99m	0	0	1	0	0	0	0
	Total		5	2	1	9	7	7	1
Najin-Sonbong	Road	\$1-9m	0	0	2	0	1	1	0
	Total		0	0	2	0	1	1	0

Export Destination - Japan					
Investment Locations	Mode of Transport	Size of Investment	Industries		
			Electronics	Minerals	Basic metals
Nampo	Water	\$10-99m	1	0	0
Pyongyang	Water	<\$1m	0	1	1

Export Destination - Russia									
Investment Locations	Mode of Transport	Size of Investment	Industries						
			Textile	Machinery	Transport Equipment	Electronics	Minerals	Basic metals	I.T.
Nampo	Water	\$1-9m	1	1	0	0	0	0	0
		\$10-99m	0	0	0	0	1	1	0
	Road	<\$1m	0	0	0	0	0	0	1
	Total		1	1	0	0	1	1	1
Pyongyang	Road	\$<1m	0	0	0	1	0	0	0
		\$10-99m	0	0	0	0	1	0	0
	Total		0	0	0	1	1	0	0
Sinuiju	Water	\$1-9m	1	1	0	1	1	0	1
	Rail	\$1-9m	0	0	0	1	1	1	0
	Road	\$1-9m	0	0	0	1	1	0	0
	Total		1	1	0	3	3	1	1
Najin-Sonbong	Water	<\$1m	1	0	0	1	0	0	1
		\$1-9m	0	0	0	1	1	1	0
		\$10-99m	0	0	1	0	0	0	0
	Rail	\$10-99m	0	1	1	0	0	0	0
	Total		1	1	2	2	1	1	1

Export Destination - Europe									
Investment Locations	Mode of Transport	Size of Investment	Industries						
			Textile	Machinery	Transport Equipment	Electronics	Minerals	Basic metals	I.T.
Nampo	Water	\$1-9m	1	1	0	2	3	2	
		\$10-99m	1	1	1	2	1	2	1
	Total		2	2	1	4	4	4	1
Pyongyang	Water	\$1-9m	2	1	1	0	0	0	0
	Total		2	1	1	0	0	0	0
Wonsan	Water	\$1-9m	0	0	0	1	0	0	0
	Total		0	0	0	1	0	0	0
Sinuiju	Water	\$1-9m	2	2	0	1	3	1	1
	Rail	\$1-9m	0	0	0	0	2	1	0
	Total		2	2	0	1	5	2	1
Najin-Sonbong	Water	\$1-9m	0	0	1	2	0	0	0
	Total		0	0	1	2	0	0	0

Export Destination - USA							
Investment Locations	Mode of Transport	Size of Investment	Industries				
			Textile	Machinery	Electronics	Minerals	Basic metals
Nampo	Water	\$1-9m	0	0	1	1	1
		\$10-99m	1	0	2	1	0
	Total		1	0	3	2	1
Pyongyang	Water	\$1-9m	1	0	0	0	0
	Total		1	0	0	0	0
Sinuiju	Water	\$1-9m	1	1	1	1	1
	Total		1	1	1	1	1

## Appendix XII – Types of Logistics Services Provided in Industries

Types of Logistics Services Provided/Industries Served	Food Processing	Textile	Petroleum	Machinery	Transport Equipment	Electronics	I.T.	Agricultural	Total
Freight Forwarding	3.21%	2.75%	0.46%	4.13%	1.83%	6.42%	1.83%	1.38%	<b>22.02%</b>
Warehousing	2.29%	2.75%	0.46%	3.67%	1.38%	5.96%	1.38%	0.46%	<b>18.35%</b>
Consulting Services	0.92%	3.21%	1.38%	0.46%	1.38%	3.67%	0.92%	0.92%	<b>12.84%</b>
Transport	1.38%	1.38%	0.00%	3.21%	0.92%	2.29%	1.83%	0.46%	<b>11.47%</b>
Customs Clearance	0.92%	0.92%	0.00%	1.83%	2.29%	2.29%	0.00%	1.38%	<b>9.63%</b>
Order Processing	3.67%	5.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	<b>9.63%</b>
Customer Service	0.92%	1.38%	0.00%	0.46%	0.46%	1.83%	0.92%	0.46%	<b>6.42%</b>
Freight Consolidation	0.46%	0.46%	0.46%	1.38%	0.92%	0.92%	0.46%	0.00%	<b>5.05%</b>
Packing/Storage	0.00%	0.46%	0.00%	0.46%	0.00%	0.46%	0.00%	0.00%	<b>1.38%</b>
Multi-modal	0.00%	0.46%	0.00%	0.00%	0.00%	0.92%	0.00%	0.00%	<b>1.38%</b>
Physical Distribution	0.00%	0.00%	0.00%	0.92%	0.00%	0.00%	0.00%	0.00%	<b>0.92%</b>
Break-Bulk Operations	0.00%	0.46%	0.00%	0.00%	0.00%	0.46%	0.00%	0.00%	<b>0.92%</b>
<b>Total</b>	<b>13.76%</b>	<b>20.18%</b>	<b>2.75%</b>	<b>16.51%</b>	<b>9.17%</b>	<b>25.23%</b>	<b>7.34%</b>	<b>5.05%</b>	<b>100.00%</b>

### Appendix XIII – Scope of Logistics Companies' Operations in DPRK

	Operations Location	Food Processing	Textile	Petroleum	Machinery	Transport Equipment	Electronics	Minerals	Non-Metals	Agriculture	Total
Warehousing	Nampo	1	1	0	1	1	4	1	1	0	10
	Sinuiju	1	1	0	0	0	0	0	0	0	2
	Najin-Sonbong	0	0	0	0	0	0	0	2	1	3
Freight Forwarding	Nampo	2	1	0	1	1	3	1	1	0	10
	Pyongyang	0	1	0	0	0	1	0	0	0	2
	Sinuiju	1	1	1	0	0	0	0	0	0	3
	Najin-Sonbong	0	0	0	1	0	0	0	1	0	2
Customs Clearance	Nampo	1			1	2	1	1	1	0	7
	Sinuiju	1	0	0	0	0	0	0		0	1
	Najin-Sonbong	0	0	0	1	0	0	0	2	1	4
Consulting services	Nampo	0	1		1	1	3	0	0	0	6
	Sinuiju	1	1	1	0	0	0	0	0	0	3
	Najin-Sonbong	0	0	0	0	0	0	0	1	1	2
Freight Consolidation	Nampo	0	1	0	0	0	1	0	0	0	2
	Najin-Sonbong	0	0	0	1	0	0	0	1	0	2
Customer Service	Nampo	0	0	0	0	0	0	0	0	0	0
	Pyongyang	0	1	0	0	0	1	0	0	0	2
	Najin-	0	0	0	0	0	0	0	1	1	2

	Sonbong										
Transport	Nampo	1	1	0	1	0	1	0	0	0	<b>4</b>
	Pyongyang	0	1	0	0	0	1	0	0	0	<b>2</b>

## Appendix XIV Descriptive statistics relating to the continuous variables

### Political Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Govt support business</b>	130	1	5	4.21	0.643	4.25	-0.946	1.986
<b>Political stability</b>	130	1	5	3.45	0.854	3.45	0.157	-0.728
<b>Regional stability</b>	130	1	5	3.28	0.787	3.26	0.139	-0.484
<b>Bureaucracy</b>	130	2	5	3.45	0.609	3.45	0.238	-0.132
<b>Risk of corruption</b>	130	1	5	3.56	0.664	3.58	-0.701	0.506
<b>Unification</b>	130	1	5	3.87	0.711	3.91	-0.731	0.848

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.281	130	0.000

- No significant difference between the mean and 5% trimmed mean, indicating that extreme scores do not have a strong influence on the mean.
- Three factors (government supporting business, risk of corruption and unification) have negatively skewed distribution. Three factors (political stability, regional stability and bureaucracy) have positively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.



## Economic Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>SEZs</b>	130	1	5	4.58	0.575	4.65	-1.488	1.647
<b>Financial sector</b>	130	2	5	3.27	0.722	3.24	0.306	-0.343
<b>Cluster industries</b>	130	2	5	3.35	0.072	3.34	-0.299	-0.815
<b>Local/Regional dev</b>	130	2	5	3.83	0.599	3.85	-0.512	0.629
<b>Market reforms</b>	130	2	5	4.02	0.506	4.04	-0.491	1.913
<b>Exchange rate risk</b>	130	3	5	3.71	0.582	3.67	0.407	-0.750
<b>Currency restrictions</b>	130	1	5	3.72	0.646	3.73	-0.218	0.532
<b>Relocation costs</b>	130	1	5	4.12	0.058	4.14	-0.935	3.403
<b>Profit making culture</b>	130	2	5	3.35	0.066	3.34	-0.037	-0.040
<b>Market economy</b>	130	2	5	4.07	0.047	4.10	-0.541	3.164
<b>Few trade restrictions</b>	130	3	5	4.07	0.425	4.08	0.182	1.233
<b>Low set-up costs</b>	130	2	5	3.73	0.068	3.75	-0.098	-0.414
<b>State incentives</b>	130	2	5	3.62	0.063	3.62	-0.160	-0.153

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.318	130	0.000

- No significant difference between the mean and 5% trimmed mean, indicating that extreme scores do not have a strong influence on the mean.

- Ten factors (SEZs, cluster industries, local/regional development, market reforms, currency restrictions, relocation costs, profit making culture, market economy, low set-up costs and state incentives) have negatively skewed distribution. Three factors (financial sector, exchange rate risk and few trade restrictions) have positively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.

### Infrastructure Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Domestic markets</b>	130	1	5	2.79	0.098	2.75	0.859	-0.332
<b>Telecommunications</b>	130	3	5	4.42	0.049	4.45	-0.243	-0.923
<b>Energy/electricity</b>	130	3	5	4.42	0.052	4.46	-0.454	-0.659
<b>Water supplies</b>	130	3	5	3.95	0.058	3.95	0.048	-0.651
<b>Logistics facilities</b>	130	2	5	3.69	0.066	3.68	0.252	-0.683
<b>Airport access</b>	130	1	5	3.44	0.076	3.44	0.046	-0.273
<b>Maritime port access</b>	130	1	5	3.98	0.065	4.00	-0.542	1.017
<b>Road access</b>	130	2	5	4.68	0.048	4.73	-1.761	3.839
<b>Rail access</b>	130	2	5	4.45	0.055	4.51	-0.892	0.754

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.306	130	0.000

- No significant difference between the mean and 5% trimmed mean.
- Five factors (telecommunications, energy/electricity, maritime port access, road access and rail access) have negatively skewed distribution. Four factors (domestic markets, water supplies, logistics facilities and airport access) have positively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.

## Legal Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Immigration policies</b>	130	1	5	2.45	0.110	2.38	0.786	-0.399
<b>Low income tax</b>	130	1	5	2.38	0.093	2.33	0.646	-0.192
<b>Fair logistics practices</b>	130	1	5	3.67	0.064	3.69	-0.486	0.828
<b>Flexible payment methods</b>	130	1	5	3.81	0.059	3.82	-0.689	1.938
<b>Govt regulations</b>	130	1	5	3.99	0.053	4.00	-0.212	0.527
<b>Labour/Tax laws</b>	130	1	5	3.92	0.056	3.91	-0.114	-0.005
<b>New regulations</b>	130	1	5	3.84	0.060	3.85	-0.240	0.101

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.313	130	0.000

- No significant difference between the mean and 5% trimmed mean.
- Five factors (fair logistics practices, flexible payment methods, government regulations, labour/tax laws, new regulations) have negatively skewed distribution. Two factors (immigration policies and low income tax) have positively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.

## Managerial Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Knowledge of logistics</b>	130	1	5	2.29	0.091	2.23	0.782	0.180
<b>Management experience</b>	130	1	5	2.59	0.099	2.58	0.164	-1.093
<b>Knowledge of management concepts</b>	130	1	5	2.53	0.098	2.50	0.273	-0.907
<b>Acceptance of new technologies</b>	130	1	5	3.68	0.061	3.69	-0.587	1.195

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.262	130	0.000

- No significant difference between the mean and 5% trimmed mean, indicating that extreme scores do not have a strong influence on the mean.
- One factor (acceptance of new technologies) have negatively skewed distribution. Three factors (knowledge of logistics, management of experience and knowledge of management concepts) have positively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.

## Spatial Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Entry into North Korean markets</b>	130	1	5	2.56	0.085	2.51	1.086	0.560
<b>Inexpensive land</b>	130	2	5	4.55	0.056	4.62	-1.309	1.426
<b>Proximity to regional markets</b>	130	2	5	3.89	0.079	3.94	-0.368	-0.694
<b>New markets for NK products</b>	130	2	5	2.82	0.071	2.77	0.690	-0.185
<b>Availability of raw materials</b>	130	2	5	4.33	0.059	4.39	-0.974	1.591
<b>Lack of sizable markets</b>	130	2	5	2.81	0.066	2.74	0.895	1.010
<b>Availability of natural resources</b>	130	1	5	4.21	0.063	4.24	-0.462	-0.520
<b>Limited NK purchasing power</b>	130	1	5	2.88	0.074	2.83	0.698	0.661
<b>Access to China and Japan</b>	130	2	5	4.07	0.058	4.09	-0.402	0.478
<b>Proximity to major suppliers</b>	130	2	5	4.09	0.054	4.11	-0.258	0.452

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.289	130	0.000

- No significant difference between the mean and 5% trimmed mean, indicating that extreme scores do not have a strong influence on the mean.
- Six factors (inexpensive land, proximity to regional markets, availability of raw materials, availability of natural resources, access to China and Japan and proximity to major suppliers) have negatively skewed distribution. Four factors (entry into North Korean markets,

new markets for North Korea products, lack of sizable markets and limited North Koreans purchasing power) have positively skewed distribution.

- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.

## Social Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Housing/School amenities</b>	130	1	5	1.94	0.085	1.87	0.951	0.246
<b>Educated labour</b>	130	2	5	3.82	0.081	3.87	-0.674	0.042
<b>Cultural affinity with Koreans</b>	130	1	5	3.17	0.074	3.15	0.059	-0.516
<b>Common culture/language</b>	130	2	5	3.22	0.077	3.18	0.394	-0.468
<b>Availability of industrial estates</b>	130	2	5	3.90	0.053	3.91	-0.370	0.843
<b>Good supply of low labour cost</b>	130	2	5	4.14	0.053	4.16	-0.285	0.579

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.289	130	0.000

- No significant difference between the mean and 5% trimmed mean, indicating that extreme scores do not have a strong influence on the mean.
- Three factors (educated labour force, availability of industrial estates and good supply of low labour cost) have negatively skewed distribution. Three factors (housing/school amenities, cultural affinity with Koreans and common culture/language) have positively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.



### Organisational Factor

	<b>N</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>5% Trimmed Mean</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Plentiful logistics service providers</b>	<b>130</b>	<b>1</b>	<b>5</b>	3.52	0.093	3.53	-0.101	-1.198
<b>Good logistics linkages and accessibility</b>	<b>130</b>	<b>2</b>	<b>5</b>	4.06	0.055	4.08	-0.235	0.224
<b>Good logistics distribution system</b>	<b>130</b>	<b>2</b>	<b>5</b>	3.97	0.056	3.97	-0.161	0.096

<b>Kolmogorov-Smirnov</b>		
<b>Statistic</b>	<b>df</b>	<b>Sig</b>
0.282	130	0.000

- No significant difference between the mean and 5% trimmed mean, indicating that extreme scores do not have a strong influence on the mean.
- All factors have negatively skewed distribution.
- Kolmogorov-Smirnov statistic is (0.000) is highly significant ( $<0.05$ ), breaching the assumption of normality.

## Appendix XV Extraction and Rotation of Factors

Rotated Component Matrix <sup>a</sup>				
	Component			
	1	2	3	4
New regulations are not imposed suddenly	.861			
Labour/tax laws do not change suddenly	.850			
Income tax for foreign employees are low	.828			
Entry into DPRK markets	.822			
Good housing/school/environmental amenities	.780			
Knowledge of logistics concepts	.749			
Limited purchasing power of local markets	.723			
Management experience	.713			
New markets for DPRK products	.708			
Knowledge of management concepts	.693			
Common culture/language	.669			
Lack of sizable markets	.666			
Cluster of common industries	.593			
Plentiful logistics service providers	.589			
Competitive financial sector	.584	.442		
Political stability	.550			
Good supply of low labour cost	.507			

Regional stability	.494			
Cultural affinity with Koreans	.448			
Local/Regional development		.744		
Unification		.672		
SEZs		.638		
Exchange rate risk		.614		
Reforms encouraging a market economy		.604		
Bureaucracy is not excessive		.583		
Acceptance of new technologies		.573		
Currency restrictions		.562		
Risk of corruption		.537		
Availability of energy/electricity		.504		
Government and officials support business		.460		
Low costs of relocation		.440		
Availability of raw materials			.705	
Availability of natural resources			.660	
Proximity to major suppliers			.641	
Inexpensive land			.625	
Access to China and Japan			.600	
Access to domestic markets			.598	.447
Clear rules governing regulations and contracts			.578	.470

Availability of industrial estates			.546	
Proximity to regional markets			.541	
Immigration policies are flexible			.527	
Good logistics linkages and accessibility			.485	
Good logistics distribution system			.454	
Road access				.796
Rail access				.657
Maritime port access				.616
Logistics facilities				.599
Water supplies				.577
Airport access				.486
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 7 iterations.				

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